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Ovarian Secretion. A Review.

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SINCE the publication in this Journal for 1904 of the valuable review on the internal secretion of the ovary by Dr. Russell Andrews, much work has been done upon the subject, but it is impossible in a limited paper of this scope to do more than mention the results of investigations upon the still uncertain chemical properties of this secretion. The ovary, in common with the other so-called ductless glands, has a controlling or regulating influence upon the activity of the various organs of the body. The gonads or sex glands are most important of all the organs concerned in the production of an internal secretion in that they have in addition a direct and specialised reproductive function. From the time of the earliest differentiation of the ovum the sex cells are distinct from the somatic cells, and have an influence upon the latter. During the early phases of development of the embryo the male and female cell characters are indistinguishable from one another, and it is only later that sex becomes apparent.

It is not proposed in this paper to enter into the relationships between the ovary and the other internal secretory organs, but references will be confined to the function of the ovary alone. The gonads are closely bound up with the physiological and pathological processes of the bodily functions as a whole. The secretion of the ovary is said to contain a hormone or hormones (Starling) which influence the reproductive and somatic tissues. The term hormone may have its disadvantages as there is still doubt as to whether the ovary produces not only a secretion which stimulates but one which also inhibits. It is here that the difficulty of the problem lies. What portion of the ovary is inhibitory in action and what is excitatory? From the mass of contradictory experimental evidence

at our disposal it is almost impossible to formulate conclusions, and we are driven to accept only those results in which the majority agree.

Other organs of internal secretion such as thyroid, or pituitary, may assume the secretory function of reproductive glands, and thus confusion arises as to the specific function of each gland or chain of glands.

Much of our knowledge about ovarian secretion is derived from experimentalists and little from clinicians, but it is to the latter that we specially look for information, the records of ovarian function in the human female being of the greatest value. There is no doubt that observations upon the various species of animals, while agreeing in the main, must differ somewhat in detail when we are concerned with the investigation of ovarian secretion, which is closely associated with the sympathetic nervous mechanism and its manifestations. It is obvious that the complexities of the nervous system and the psychic phenomena dependent upon the reproductive functions must make for a considerable difference between the ovarian function of the human species and that of the lower mammals or birds. For many years the ovary was looked upon as an organ having only one function, viz., that of reproduction, but it is now admitted that it has a marked influence upon the nutrition of the other generative organs and the secondary sexual characters of the individual. Much of our information as to the physiological influence of the ovary is gained by observations upon the changes which take place after oöphorectomy or after transplantation of ovarian tissue to sites other than the normal. That the male and female reproductive organs have a common influence upon development is evidenced by the skeletal changes which occur at puberty, and that there is a differentiation in the character of the secretion at this period is shown by the variation in the secondary sexual characters of the individual, along with the different phenomena which can be demonstrated as peculiar to each sex.

It is difficult to separate the various physiological functions of the internal secretory organs as they have a marked influence upon one another, some having an inhibitory or antagonistic action which has full play when the opposing gland has been removed. As an example of this influence we have the persistence of the thymus after castration in young animals (Noël Paton).

It is impossible until much more work has been done upon the subject to formulate an opinion as to where the secretory action of a particular gland begins and where it ends, or how the function of an extirpated gland has been assumed by the other glands. This is of special interest in connection with metabolism, the processes of which are to a great extent regulated by these internal secretory organs. When the physiological functions are interfered with or changed by

pathological lesions the problem of the chemical correlationships that exist between these various secretory organs becomes increasingly difficult. Whether the secretion of one organ is diminished or increased as the result of some disturbance taking place in another organ it is often impossible to arrive at a conclusion as to the origin of the effects which are produced clinically or experimentally.

Influence of ovarian secretion upon development.

That the ovary has a marked influence upon the development of the individual is evidenced by the changes which take place at puberty. In the human female at puberty the secondary sexual characters of the feminine type are developed, viz., the rounding of the curves of the body, the enlargement of the mammæ, the growth of hair in the axillary and pubic regions, the increased growth of the genital organs together with the onset of menstruation and its accompanying phenomena. All these changes are associated with psychic manifestations characteristic of the female sex. Changes take place in the ossifying centres of the bones. Enlargement occurs in some of the other internal secretory organs such as the thyroid and pituitary glands, although regressive changes are observed in the thymus. The effects of suppression of ovarian secretion before the onset of puberty in the human female have not been recorded owing to the extreme rarity of the operation of oöphorectomy in young girls. The records of operations among uncivilised people for removal of the external genitals are not to be taken as evidence of the interference with ovarian function. In some cases information is obtained from the examination of women in whom the ovaries are either congenitally absent or deficient in physiological function. In such cases we frequently find maldevelopment of the external genitals and mammæ with absence of menstruation, although the development of the individual as a whole may be unaffected. Cases, however, are met with where the secondary sexual characters of the female are present but where the ovaries and uterus are absent, or where the internal secretory glands show the presence of testicular tissue when examined under the microscope. Such cases are still unexplained. Biedl states that after castration in males, as in eunuchs, there is delayed ossification of the lower bones and that it is most probable that a similar delay takes place in the human female.

Our knowledge about the effects of removal of the ovaries in animals before the onset of sexual maturity is fairly extensive, and the majority of workers are in agreement as to the suppression of the secondary sexual characters following castration. Castration in young animals causes an arrest of development in the genital organs and mammæ with subsequent atrophy. This is now no longer a matter of controversy. Marshall suggests that the female would

take on the male characters which are normally latent in each individual but that the presence of ovarian secretion has an inhibitory action upon the development. He adduces as proof of his argument the records of cases in which female fowl and deer have taken on male appearances after castration or when ovarian secretion is defective. Carmichael and Marshall have shown that castration of young rodents does not affect the growth and general nutrition of the animal. It is still, however, a matter of doubt whether the normal sexual instinct of the animal has been affected by the removal of the reproductive glands in early life.

Removal of the ovaries after puberty.

The effects of the removal of the ovaries after puberty has been reached are not so marked as in cases of removal before puberty since the sex characters in the former case have become established. It is generally accepted by experimentalists that atrophy of the uterus, mammæ and other genital organs takes place (Carmichael and Marshall, Marshall and Jolly). On microscopic examination the uterus shows degenerative changes resembling the condition known as fibrosis, the glands are reduced in size and number and eventually disappear—the degree of degeneration depending upon the length of time the animal has been kept after operation. The blood vessels are diminished in size and number. The lining epithelium of the mucosa is the most persistent tissue and is the last to disappear. Proœstrum or œstrus do not occur. Clinically it has been found that removal of the ovaries is followed by the cessation of menstruation, and degenerative changes occur in the genital organs, although the majority of workers agree as to the cessation of menstruation a few still question this statement and bring forward evidence of the recurrence of menstruation after oöphorectomy (Alban Doran). Such cases cannot be proved by experiment in any species of animal, and are doubtless to be explained by the presence of a small piece of ovarian tissue which has been overlooked in removal, or by the existence of a supernumerary ovary or piece of an ovary in some other situation. In the examination of such cases a clear distinction must be drawn between menstruation and uterine hæmorrhage due to some existing pathological condition of the cervix or uterus.

Some authors think the atrophic changes in the uterus are due to the cutting off of the vascular or nervous supply at the time of operation (Hofmier, Sokoloff).

Removal of one ovary has no physiological effect as the remaining organ assumes the function of both and in the majority of cases becomes hypertrophied (Carmichael and Marshall). Bond found that this compensation took place only when pregnancy or œstrus had occurred, and concludes that bilateral ovaries function as one

gland with regard to their internal secretion. That this compensatory hypertrophy takes place irrespective of pregnancy or œstrus is evidenced by the experiments of Carmichael and Marshall, who found hypertrophy of ovarian tissue even when only a small portion of one organ was left behind and when the animals (rabbits) were isolated, assuming that ovulation in the rabbit only takes place on copulation (Heape). The work of these authors was supported by my own experiments upon rabbits.

During early pregnancy if one ovary is removed abortion does not necessarily take place, although on removal of both ovaries there is interference with the embedding and development of the ovum in the uterus. Evidence of the effect of cessation of ovarian function is to be found in the phenomena which take place at the time of the menopause when the ovaries show atrophic degenerative changes—menstruation ceases, atrophy of the uterus and mammæ takes place, and various nervous and vascular phenomena occur. In the surgical menopause the symptoms as a rule are more marked owing to the sudden removal of the ovarian secretion before the individual has become accustomed to the changes in the adjustment of the equilibrium of the internal secretory organs such as take place gradually under normal conditions.

The conclusions as to the effect of castration are, that before puberty there is an arrest in the development of the genital organs and mammæ. After puberty there is an atrophy of these organs with cessation of pro-œstrum and œstrus. The growth and development of the young animals are said to be unaffected (Marshall, Grigorieff, Halban, Carmichael). The majority of clinicians agree as to the occurrence of degenerative changes, cessation of menstruation and menopausal symptoms. Pozzi, however, records a case of menstruation occurring after double oöphorectomy in which there was development of a fibroid tumour in the uterus subsequent to the operation. In such cases the question of uterine hæmorrhage apart from menstruation has to be carefully considered.

The influence of ovarian secretion upon menstruation.

That menstruation or pro-œstrum depends upon ovarian secretion is proved by the fact of its onset at puberty or sexual maturity, and by its cessation on removal of both ovaries. Should a small piece of ovary be left in position or transplanted to another situation menstruation occurs. In cases of amenorrhœa after double oöphorectomy menstruation has been known to recur on subsequent grafting of a piece of an ovary from another individual.

The changes which occur in the uterus during reproductive life are cyclic in character, and correspond to certain changes which take place in the ovaries. The same phenomena occur throughout the whole mammalian species, but differ somewhat in their periodicity

and duration. It is now admitted by most authorities that menstruation corresponds to the pro-œstrous period in mammals, and is of the nature of a preparatory process on the part of the uterus for the reception of a fertilised ovum. The subsequent or œstrous period being that period when fertilisation is most likely to take place. The recurrence of this cyclic process among animals is influenced by seasonal and nutritional changes. The whole reproductive cycle comprises a resting or an œstrous period, this is followed by congestion of the pelvic tissues and changes in the other internal secretory organs. A hæmorrhagic discharge occurs in the uterine and tubal mucosæ in the human female and in the majority of mammals, and constitutes the pro-œstrum or menstruation. There is thickening of the mucosa at the same time and the discharge consists of blood, mucus and exfoliated epithelial cells. After the cessation of the discharge there is a proliferation of the cells of the mucosa. If fertilisation does not take place the pelvic organs gradually return to their original condition of physiological quiescence. In some of the lower mammals there is no hæmorrhagic discharge but merely a flow of mucus. In the rabbit there is no evidence of the presence of heat apart from copulation with the male. The chemical nature of the uterine discharge during menstruation is still unknown although a considerable amount of work has been done with regard to the presence of calcium salts (Blair Bell). But our knowledge is incomplete as far as concerns the nature of the chemical substances or ferments which are present as the result of ovarian secretion. Pro-œstrum can be induced to a certain extent by transplanting ovaries from an animal in the œstrous state to an animal whose pelvic organs are quiescent, or to one which has been previously castrated (Marshall and Jolly). This condition can be induced by injections of extracts from œstrous ovaries.

There is still much doubt as to the factors which influence the ætiology of menstruation and ovulation and it is difficult to separate these two phenomena. It is thought that menstruation is an expression of ovulation (Bischoff). The theory held by Pflüger has had many adherents, that the maturing follicle generates stimuli which cause a congestion of the pelvic organs, and this in turn brings about the bursting of the follicle with expulsion of the oöcyte and discharge of blood from the uterine mucosa. It is said that by raising the blood pressure in the ovary symptoms of pro-œstrum can be induced (Strassmann). There is no doubt that menstruation is dependent upon the existence of ovarian secretion as proved by the experiments in which the ovaries are removed and transplanted to different situations. The menstrual periods continue but cease later when the grafts themselves are removed (Halban, Marshall and Jolly, Kuaner). The phenomena which accompany menstruation are dependent upon the presence of ovarian secretion and not upon

the uterus or uterine secretion. These cyclic phenomena have been known to occur—with the exception of menstrual hæmorrhage which is due to the presence of the uterine mucosa—after hysterectomy when the ovaries are left behind, in cases where there is a rudimentary uterus with normal ovaries, or even when the uterus is congenitally absent. Mandl and Bürger, however, found that all cyclic changes disappear after hysterectomy alone, but there is little support elsewhere for their theories. Menstruation must be looked upon not as a hæmorrhage from the uterus and tubes, but a cyclic change which occurs in the mucosa of these organs preparatory to the reception of a fertilised ovum, the hæmorrhage being of secondary importance (Hitschmann and Adler). These changes occur in the uterine mucosa of the majority of mammals even where the accompanying hæmorrhage is very slight or absent (Keller). The view that menstruation is due to the reflex stimuli from pressure upon the follicles is to be questioned in the light of the fact that menstruation and pregnancy have been known to occur in women affected with paraplegia. The relationship between menstruation and ovulation is still unknown, but they are in close relationship one to the other. Menstruation may be taken to a certain extent as an expression of ovulation but is not necessarily an accompaniment of this phenomenon. Heape made a series of observations upon the ovaries of menstruating monkeys but did not find ripe follicles in every case. Morris records the case of onset of menstruation in an infantile uterus after grafting of an ovary from another individual. It is, however, difficult to believe that menstruation could occur with anything like normal periodicity in a congenitally small uterus. Heape believes that the occurrence of "heat" is due to the presence of a generative ferment periodically present in the blood. He believes that another substance, "gonadin," is also present and has a specific action, but what the relationship of these to one another is as yet unknown. It may be taken as accepted by the majority of observers that the ovary secretes a substance or substances whose chemical characters are unknown, the secretion being poured into the general circulation at periodic intervals. The periods vary according to the different species of mammals. This secretion has a specific action upon the uterine and tubal mucosa causing a breaking down of blood vessels, diapedesis, and exfoliation of epithelium. A hæmorrhagic discharge takes place from the mucosa containing the metabolic elements which are unnecessary for the implantation of the fertilised ovum. Menstruation is therefore a manifestation of metabolic processes and the uterus is an organ for the excretion of these products which have their origin in the ovary. This explains the general constitutional disturbances which are present in cases of scanty menstruation or when menstruation is in abeyance as in amenorrhœal conditions associated with insanity of

a toxæmic origin. The ovary gives rise to a condition of toxæmia which under normal conditions is not noticeable owing to elimination taking place by means of the uterine hæmorrhagic discharge. As menstruation is due to the internal secretion of the ovary it may be asked which part of this organ is most concerned in its production? Most authorities agree as to the corpus luteum being the most important factor. Fränkel found that after cauterization or removal of the corpus luteum the next period was missed. Marshall denies that the corpus luteum is necessary for the onset of menstruation as ovulation in most animals does not occur until œstrus or at the end of the pro-œstrous period, *i.e.*, before corpora lutea are present in the ovaries. Heape found no corpora lutea in some of the ovaries of menstruating monkeys.

Influence of ovarian secretion upon pregnancy and lactation.

Histological examination of ovaries removed during pregnancy show enlargement of the interstitial cells and development of the corpus luteum, this points to some increased functional activity on the part of these tissues. It is, however, generally believed that the ovaries are quiescent during pregnancy. Halban found as proof of this that the long bones show increase in length in young women during pregnancy. There is frequently increased deposit of fat during this period. Fränkel's experiments, however, contradict this belief and point to the activity of the corpus luteum which has a trophic influence upon the nutrition of the ovum in the early stages of pregnancy. Marshall and Jolly confirm these experiments. Loeb removed the corpora lutea in later pregnancy and found that regeneration took place in these tissues. He carried out a series of experiments upon recently fertilised rodents by mechanical stimulation of the uterine mucosa. This was followed by the appearance of decidual nodules in the uterus. If the corpora lutea were removed by cauterization or excision prior to the experiment no decidual reaction took place, thus showing the influence of the corpus luteum upon decidual formation. It may be taken as accepted that the corpus luteum is an essential factor in maintaining the raised nutrition of the uterus during early pregnancy and ultimate nutrition of the ovum (Vincent).

Clinically we find a correlation between the corpus luteum and decidual tissue in cases where lutein cysts are found in connection with syncytioma. The corpus luteum acts as a ductless gland with an internal secretion having an influence upon metabolism and upon the nutrition of the ovum in the uterus. Any interference with the trophic influence of this secretion causes separation of the ovum from its uterine attachment in the early stages of pregnancy. If fertilisation does not take place it is found that the corpus luteum degenerates and forms a scar.

Cases of repeated or so-called habitual abortion may be explained by the occurrence of some pathological changes in the corpus luteum, but this is still a matter only of theory. It is said that the application of *x*-rays to the ovaries during pregnancy does not cause abortion, and as these rays have a specific action upon the follicles of the ovary, it is still a matter of doubt how far the interstitial cells have to be considered with regard to their trophic influence upon the ovum. The persistence of the corpus luteum during pregnancy is held to be a factor in the prevention of the occurrence of ovulation and menstruation, but clinically cases of menstruation during early pregnancy are not infrequent. Also examples of superfœtation have been observed among animals. The view that the persistence of the corpus luteum prevents the onset of "heat" in animals receives support from the fact that agriculturists are able to induce "heat" by manipulating the ovary of young cows through the rectum and expelling the corpus luteum. This is followed by œstrus and fertilisation.

Lactation.

That the ovaries have an influence upon the development of the mammæ is seen from the enlargement of the breasts at puberty. These glands become enlarged frequently before the onset of and during menstruation—the period when ovarian activity is at its height. Congenital absence of the ovaries is as a rule accompanied by deficient mammary development; and castration of young animals prevents the growth of these organs. Atrophy of the mammæ takes place after oöphorectomy in adults and after the menopause. The occurrence of these changes after castration can be prevented by the transplantation of ovarian tissue to different situations. It must therefore be admitted that the ovaries have a marked influence upon the nutrition of the mammary glands by means of their internal secretion which acts irrespective of their vascular or nervous connections. The mammary glands enlarge during pregnancy and secrete milk after parturition has taken place. What this enlargement is due to is still a matter of controversy. Foges believes that the ovary causes development of the mammæ but has no influence upon the secretion of milk, this secretion taking place when the ovaries are in a quiescent state.

What is the important factor in the production of mammary secretion? This is still unproved. Lane-Clayton and Starling carried out some experiments by injecting fœtal extracts into virgin rabbits and obtained increased growth of mammary tissue. They concluded that the fœtal tissues produce a hormone which excites mammary growth and secretion. Foa found similar results with injections of fœtal tissues from one species of an animal to another. Heape found that milk secretion can take place in virgin animals,

and that it can occur apart from pregnancy without the stimulation of fœtal tissues. He supposes that the stimulation has its origin in the ovary. Vincent points to the corpus luteum as an essential factor and quotes O'Donoghue, who states that the mammæ enlarge in proportion to the growth of the corpus luteum and concludes that the corpus luteum is "intimately connected if not indeed the exciting cause of the growth of the mammary gland" (p. 85).

Ancel and Bouin found in rabbits that when copulation took place with a sterilized male the corpus luteum was enlarged and also the mammæ. This enlargement persisted for some days and then regression occurred, showing the dependence of mammary growth upon corpus luteum development. They believed that the corpus luteum secretion has an influence upon mammary growth but that the secretion of milk depends upon the presence of specialized glands in the uterus. Cases of mammary secretion occurring in males and in new-born children contradict the theory that the phenomenon is due to the presence of fœtal tissue secretion. That ovarian secretion is suppressed during lactation is negatived by those cases of menstruation occurring during lactation. In some such cases it is found on enquiry that during menstruation there is evidence in the child of derangements of metabolism, viz., diarrhœa and vomiting, showing that some products of ovarian secretion are in circulation in the tissues by means of the blood and that they have the mammæ as a channel of excretion in addition to that of the uterine mucosa. The corpus luteum of pregnancy is said to persist during lactation (Watson).

Maniger records a case of lactation after full term pregnancy in a patient the subject of double oöphorectomy, showing that it can occur apart from ovarian influence. Milk secretion can be augmented by the administration of various organ extracts such as infundibular extract (Mackenzie). It is doubtful, however, whether these administrations only cause a temporary stimulation of the mammary ducts by giving rise to muscular contraction. It is seen that little is known with regard to the etiology of mammary secretion and much research is wanted in order that definite conclusions may be reached.

Function of the various constituents of the ovary.

The ovary may be divided into three constituents as far as functional activity is concerned—the Graaffian follicle, the corpus luteum and the interstitial cells. Much controversy has arisen over the origin of these tissues, but it is now generally accepted by most workers on the subject that they have a common origin in the early germ cells or oögonia (Waldeyer, von Winiwarter, Skrobansky), and that the stroma is only vascular and supporting in its function. Some authors (Clark, Wendeler) maintain that the follicle cells are

connective tissue in origin. The views on the subject of this controversy are fully referred to in a paper published by me in 1910. The Graaffian follicles in the majority of mammals are present in the ovary before birth and their chief function is concerned with the production of oöcytes. These follicles develop later, rupture with extrusion of the oöcyte causing the phenomenon of ovulation to take place. The cause of rupture further than that of increased intra-follicular tension is unknown; according to Clark it is due to circulatory changes with engorgement of blood in the ovary, the increased intra-ovarian tension forcing the oöcyte to the surface. A further development of the follicle takes place by the formation of lutein tissue in its walls with hæmorrhagic infiltration—the corpus luteum. The follicle therefore is engaged in the production of the oöcyte, and the lutein tissue has a trophic effect upon the nutrition of the ovum and the metabolism of the organism as a whole. There is still uncertainty as to which part of the ovary is most concerned with the production of an internal secretion. In transplanted ovarian tissue it has been found that follicular growth in the grafts prevents the onset of atrophy of the uterus.

The *interstitial* cells are distinguished from the stroma cells by their larger size and more oval-shaped nuclei. They increase in size during pregnancy (Lane-Clayton, Wallart and Seitz) and during the œstrous season, being small in size in the anœtrous state (Regaud and Dubreuil). Wallart found the interstitial cells to be most marked between infancy and puberty; he found enlargement during pregnancy and menstruation and in association with syncytial tumours. He found that these cases were atrophied after the menopause. Cohn thinks that these cells resemble lutein cells and those of the suprarenal cortex, and that they are secretory in function. In my own experiments I confirmed those of Limon who found that the presence of interstitial cells in grafted tissue was sufficient for the maintenance of uterine nutrition. It is a matter of controversy whether these cells act in conjunction with the follicles and corpora lutea, or are antagonistic to them. It is most probable that the ovary elaborates more than one internal secretion and that the interstitial cells are responsible for part of this secretion, but the nature of such secretion or secretions is still unknown. If one ovary is removed the remaining organ becomes hypertrophied and takes on the function of both. In the microscopic examination of such an organ the interstitial cells are found to be increased in size and number. It is possible that the interstitial cells are concerned with the nutrition of the genital organs and their cyclic changes; and that the corpus luteum secretion has an effect not only upon the developing ovum but upon the metabolism as a whole. Bouin and Ancel maintain that the interstitial cells of the testes have a marked secretory function and influence the secondary sexual characters.

They injected interstitial cell tissue and modified the effect of castration upon guinea-pigs.

The *corpus luteum* is formed subsequently to rupture of the follicle. The origin of the lutein cells is still controversial. Some observers maintain that they are derived from the theca interna and are therefore of the nature of connective tissue (Kölliker, Nagel, Clark, Whitridge Williams). Others claim that they have a common origin with the oögonia (Sobotta, Marshall, Cohn, Fränkel). According to Heape the corpus luteum is formed by ingrowths of cells surrounding the follicles together with the follicular epithelium. Loeb believes that they are derived both from connective tissue and from epithelium. If fertilisation does not take place after rupture of the follicle degeneration of the corpus luteum gradually occurs. On the other hand if fertilisation does take place there is persistence of the corpus luteum and increase in size.

The corpus luteum of pregnancy is therefore a further stage in development from that occurring during menstruation. Prenant first drew attention to the corpus luteum as a ductless gland having an internal secretion, stating that it prevents ovulation during pregnancy and influences the general metabolism. In this view he is supported by Regaud and Dubreuil. The corpus luteum was formerly supposed to preserve the circulation of the ovary and thus prevent the formation of excessive scar tissue, but in view of more recent investigations upon the function of this organ it may be accepted that its function is much more complex. It is more probable that the interstitial cells have an influence over the nutrition of ovarian tissue. Fränkel's experiments showed that the corpus luteum has a secretion which controls the vascular supply of the uterus and determines the occurrence of menstruation. In addition it has an important function in causing changes to take place preparatory to the embedding of the ovum in the uterine mucosa, and the maintenance of the developing embryo until at least the formation of the placenta is completed. It therefore has a trophic influence upon the fertilised ovum. His conclusions were based upon experiments for removal of the corpus luteum by excision or cautery in rabbits at various stages of pregnancy. In early pregnancy abortion invariably took place. In women removal of the corpus luteum prevented the onset of the next menstrual period. In extra-uterine pregnancy changes occur in the uterine mucosa which must be due to some influence outside the uterus and not to the ovum alone. Pathological changes occurring in the ovum such as syncytioma are frequently accompanied by lutein cysts in the ovary. Skrobousky does not support the theory that the corpus luteum prevents ovulation from taking place during pregnancy. He is therefore in agreement with Prenant. Marshall and Jolly conclude that after ovulation which has taken place during œstrus, the

corpus luteum is formed and that this organ elaborates an additional secretion which is responsible for the embedding and early nutrition of the ovum in the uterus. Vincent, in discussing the function of the corpus luteum, makes the observation that "heat" in animals cannot be induced by an internal secretion from the corpus luteum since ovulation in dogs and most mammals normally takes place during œstrus, and that therefore no fully formed corpora lutea are to be found in the pro-œstrous period. He concludes that "heat" is brought about by an internal secretion of the ovary and not of the corpus luteum. Loeb thinks that the corpus luteum secretes a fluid which sensitizes the uterine mucosa and is concerned in the embedding of the ovum and formation of the placenta. Rebaudi regards the corpus luteum as the most important if not the only element in the internal secretory function of the ovary. The experiments of Fränkel have been confirmed subsequently by numerous other observers (Daels, Kleinhaus and Schenk). Marshall contends that "heat" occurs in many animals at infrequent intervals, and in some animals since ovulation only takes place at the œstrous period, there are no corpora lutea in the pro-œstrous period. Fränkel's experiments with regard to menstruation are inconclusive. Records of cases in which after oöphorectomy in the early months pregnancy went on without interruption, are to be taken as doubtful, the explanation of such cases being most probably that a portion of an ovary had been left behind. Ancel and Bouin found hypertrophy in the uterine mucosa of rabbits in which ovulation had taken place without fertilisation. In Loeb's experiments for stimulation of the uterine mucosa in the presence of corpora lutea in the ovary, if a piece of the uterus was grafted elsewhere nodules appeared in the mucosa of the engrafted tissue, showing that the corpus luteum had an effect without the presence of a fertilised ovum in the uterine wall. It must be remembered in those experiments for excision or cauterisation of the corpus luteum that most probably there was some interference with the function of the interstitial cells at the same time and it is difficult to formulate conclusions as to the function of the corpus luteum alone. It has been observed that the lutein cells closely resemble those of the cells of the suprarenal cortex, and that these latter cells are subject to cyclic changes, enlarging during the sexual seasons and during pregnancy (Kolmer). That the suprarenal cortex is intimately connected with the secondary sexual characters is shown by the changes which occur in the presence of tumours of this region with precocious sex development and aberrations (Glynn).

Effect of transplantation of ovarian tissue.

It is now accepted that the ovary takes on its normal functional activity when transplanted to other situations, and that it continues

to grow and produce ova which are capable of fertilisation (Knauer). Cases of pregnancy in women following transplantation have been recorded (Morris). Halban, in young guinea-pigs previously castrated, found that ovarian grafts caused uterine and mammary development. The occurrence of atrophy after oöphorectomy has been prevented by transplanting ovarian tissue (Marshall and Jolly, Ribbert, Carmichael and Marshall, Grigorieff). Some of these authors found that ovulation occurred in the grafted tissues with formation of corpora lutea. In monkeys menstruation ceases after oöphorectomy, but it has been known to become re-established after transplantation of ovarian tissue. Œstrus takes place in rabbits in which grafts have been made (Nattrass). Most authors agree, however, that a certain amount of degeneration takes place subsequently in the grafted tissue. The presence of follicles seems to be the essential factor in the promotion of uterine activity, but it is questionable whether the interstitial cells do not play an equally important part in the maintenance of the nutrition of the other genital organs. Steinach grafted ovaries subcutaneously into young male guinea-pigs previously castrated. These animals subsequently developed female characters such as enlargement of the mammæ and changes in the skeletal structures. His results point to a specific action on the part of the secretion from the male and female gonads. Tuffier gives his clinical experience of ovarian grafting in 130 cases. He found that the grafts were of most value in the prevention of the onset of menopausal symptoms after oöphorectomy if the uterus was not removed, and he argues from this that the ovary is a link in the chain between the uterus and a toxin in the blood causing ovulation, and that elimination takes place by means of the uterine mucosa. Menopausal symptoms were more pronounced if the uterus were removed with the ovaries. In the subsequent discussion on his communication the opinion was expressed that ovarian grafts were of little value unless part at least of the uterus were left behind. This will be accepted when it is understood that the uterus is a channel for the excretion of metabolic products, and that it exercises this function when the ovarian tissue is present in the form of grafts which give rise to substances in the blood of the same nature as those which normally are to be eliminated by the uterine mucosa. Autoplastic grafts are more successful than those from another animal. Transplantation from animals more akin to each other are also more successful than non-related animals. Grafts succeed best when implanted into vascular structures such as the kidney or spleen, although in the human female it is found that the abdominal wall is the most suitable site, being easy of access for removal of the graft should any subsequent disturbance arise such as pain or suppuration. Guthrie's varied experiments upon fowls show the influence of ovarian grafts upon the offspring. It is to be concluded that the

presence of ovarian tissue in the normal situation or elsewhere causes development of the genital organs and mammæ; and that in cases of tissue transplanted after castration atrophy of these organs is prevented and their functional activity is maintained. That the ovary is an organ with an internal secretion independent of its vascular or nervous supply is proved by the physiological activity of grafted tissue. Premature menopausal symptoms occurring after oöphorectomy may be prevented by the transplantation of ovarian tissue into other regions of the body, and although these frequently degenerate later, they are of benefit in that they modify the severity of the symptoms which accompany the removal of both ovaries.

Ovarian extracts.

Since the work of Brown Séquard upon testicular and ovarian extracts, which was published in 1889, much attention has been paid to the effect of glandular extracts and their therapeutic value in disease. The results of medication by ovarian extracts are contradictory. One finds that ovarian extracts have not gained a valuable place in therapeutics when one compares the results with those given for extracts of the other internal secretory organs such as the suprarenals. Various methods of administration have been advocated, such as dried and powdered ovarian tissue as a whole, fresh tissue, fluid extracts—aqueous or alcoholic—of the ovary at various periods of functional activity, also extracts of the corpus luteum alone. Administration by the mouth, rectum, or hypodermically has been tried. Much depends upon the mode of preparation of the extract and upon the active condition of the ovaries themselves. The best results have been obtained in those cases in which the menopause has been surgically produced (Krusen). Various authors advocate ovarian extracts for menopausal symptoms, amenorrhœa or chlorosis. Obesity has been said to have improved by the administration of ovarian extract (Bucura). Fränkel is of the opinion that the corpus luteum is the only part of the ovary which has any therapeutic value, and this is confirmed by Morley's results. Numerous experiments have been performed with a view to ascertaining the physiological influence of ovarian extracts. Marshall and Jolly produced transient signs of "heat" in anœstrous animals by injections of ovaries from œstrous animals. Extracts from quiescent ovaries gave negative results.

Della Chiaje caused fatty degeneration of the ovaries by injecting serum from castrated animals, but his experiments seem to be complicated by other factors. Blair Bell and Hick experimented upon the degrees of contractility of the uterus after injections of fresh extracts of sheeps' ovaries. There was no effect in the quiescent uterus, but in the menstruating or pregnant uterus there was a marked result. It is said that ovarian extracts should not be

administered to pregnant women owing to their toxic effects.

The results of the administration of ovarian extracts upon metabolism are contradictory. It is said that corpus luteum extracts when given to castrated animals prevent atrophy of the genital organs but this is denied by some (Carmichael and Marshall). In spite of Bucura's results there is still some doubt as to the unfailing influence of ovarian extracts upon obesity and upon the excretion of lime salts. Ott and Scott found that corpus luteum extracts caused a fall of blood pressure which was followed by a transient rise. They also stimulated intestinal peristalsis and increased mammary secretion, but had no influence upon diuresis. According to these authors the corpus luteum has more influence than the other parts of the ovary. In some of my own experiments I found that corpus luteum extracts had an effect in raising blood pressure.

Influence of ovarian secretion upon metabolism.

That the secretion of the ovary has an effect upon the metabolism of the organism as a whole is evidenced by the constitutional disturbances which arise during menstruation and at the menopause. We are, however, still ignorant of the nature of this influence or to what extent it may act. Numerous observations have been made in regard to the changes which take place after removal of both ovaries, but the results are very contradictory and in many cases the experiments are incomplete and therefore of little value. Some information as to the influence of the ovaries has been obtained from analogous experiments upon male animals since in all the internal secretion of both types of reproductive organ has a similar influence upon metabolism.

The chief means of estimating the metabolic changes which take in an organism are by observations upon the growth and nutrition of the animal, the respiratory interchanges, the deposit of fat, and the excretion of nitrogen, calcium and phosphorus. These are best observed experimentally in their relationship to ovarian function by noting the conditions present before and after castration, before puberty and during reproductive life. Estimations upon the metabolism at puberty or the menopause are difficult to carry out owing to the length of time which these changes of condition occupy, more especially in the human female. Thus our information is mainly derived from experiments upon laboratory animals, and as these differ according to the species employed it is easily seen how records may be fallacious unless sufficient proof is brought forward of similar processes occurring in other groups of animals.

Growth of bone. In eunuchs there is increased length of the long bones due to longer persistence of the epiphyseal cartilages, verified by skiagraphs. This has been observed also in cattle, dogs, fowl (Sellheim, Launois and Roy, Tandler and Gros). No reliable

information has been obtained as to the changes which take place after oöphorectomy in girls before puberty. It is said in the human male that the secondary sexual characters are frequently undeveloped after castration before puberty and that mental deficiency is sometimes present. In women where there is early maturity of the genital organs, shortening of the long bones has been sometimes noted due to premature ossification of the epiphyseal cartilages. In delayed reproductive development in girls lengthening of the bones may be present. In view of the records given by Glynn we cannot lay stress upon the influence of the ovaries alone as so many factors connected with the secretion of the other ductless glands and their influence upon reproductive development claim consideration. This must especially be remembered when dealing with the question of osteo-malacia.

General nutrition and deposit of fat. It is stated that castration has no effect upon the growth and general nutrition of rodents (Carmichael and Marshall). Castration is largely made use of by agriculturists in the rearing of cattle and fowls for market purposes as there is increased deposit of fat. It is questionable whether the fat deposit is due to diminished oxidation of the tissue cells or to diminished energy on the part of the animal. In women obesity is frequently observed after oöphorectomy and at the menopause and also in such conditions of scanty menstruation or amenorrhœa occurring in comparatively young women where ovarian function has become diminished. It is said that after oöphorectomy or after the menopause obesity is observed in 42 to 52 per cent. of women (Biedl). Animals become fatter during pregnancy, and this fact is made use of by farmers by having their animals in better condition for market in early pregnancy than at any other time.

Respiratory quotient. van Noorden tabulates the records of observations upon gaseous interchanges, the majority of which show a diminution in castrated animals, these animals were found to be less active than the controls. Loewy and Richter found increased gaseous interchanges on feeding with ovarian substance, they diminished on withdrawal of the gland administration. After castration metabolism was reduced, the respiratory quotient being diminished 14 to 20 per cent. per kilo of body weight. They think this is due to diminished processes of oxidation. These results were not confirmed by others (Luthjé, Paechtner).

Nitrogen. van Noorden found no change in nitrogen metabolism after castration, and the results of other workers are contradictory. Schrader found retention of nitrogen immediately before and during menstruation. Lüthjé, Neumann and Vas found no change after castration.

Calcium and phosphorus. The results of observations are very inconclusive. Curàtulo and Tarulli found retention of earthy phos-

phates after castration. Neumann found slight loss P_2O_5 and Ca as increased excretion in the fæces after feeding with ovarian substance. McCrudden found no retention of mineral salts after castration. In osteo-malacia Fehling maintains that the removal of the ovaries causes a diminished excretion of lime salts. This, however, has been called in question of late years owing to the results of calcium metabolism with regard to other ductless glands. It is therefore probable that the thyroid and parathyroids may also be involved in the production of this disease. Bossi is of opinion that the adrenals are also involved. Wallart found increase in size of the interstitial cells of the ovary in osteo-malacia although all other observers have denied the existence of any apparent histological changes. In the discussion of this disease Biedl is of the opinion that there are other internal secretory organs concerned in its production. Blair Bell has found increased calcium in the blood during menstruation. As a result of examination of menstrual and hæmatocolpos fluid there is an increased calcium content when compared with systemic blood. This author affirms that a low calcium content in the blood is due to diminished genital function and he advises the therapeutic use of calcium salts in these conditions. It is highly probable that there is a relationship between the calcium metabolism and ovarian secretion but secretions of other ductless glands have also to be considered. The calcium index may be of value as indicative of the presence of ovarian ferments in the circulation.

Blood. Chlorosis has always been associated with diminished ovarian function, but as yet there is no experimental evidence in proof of this. Some workers have found diminished hæmoglobin after castration, others obtained no change. Villemin considers chlorosis to be a toxæmia due to retention of the internal secretion of the corpus luteum. It is admitted that many cases of metrorrhagia are due to derangements of the internal secretion of the ovary (Hitschmann, Adler, Blair Bell). Adler tried to determine the rate of coagulation of blood in women having menstrual disorders by Wright's method. He found retardation in cases of diminished ovarian function, coagulation being delayed for three minutes or more. In experiments on animals before and after castration, coagulation was found to be retarded after the operation. Adler concludes that ovarian secretion has a direct influence on coagulation of the blood by means of the calcium salts. Early maturity associated with small stature due to want of fixation of calcium in the organism may also have its origin in ovarian secretion.

Nervous system. That ovarian secretion has a marked influence upon the sympathetic nervous system is well known. Neuroses are observed at puberty, during menstruation and at the menopause as evidenced by headache, fainting fits, etc. In some mental pathological conditions ovarian secretion has an effect in aggravating the

symptoms. In toxæmic conditions associated with menstruation reflex disturbances such as vomiting sometimes occur.

Skin. Dermatologists are well aware that many skin affections in women are aggravated at the onset of menstruation. Changes in the skin occur also at puberty, during pregnancy and at the menopause.

It is seen on a review of the work done upon metabolism and ovarian secretion that the data are very unreliable and that much work has to be done in this direction. So many statements have to be confirmed or refuted by further research, such as the calcium metabolism, also much work will have to be done upon the blood changes which take place during reproductive cycles, not only microscopically but chemical especially in regard to the serum changes which occur. In this way it may be possible to ascertain the presence of toxines or ferments generated by the ovary and circulating in the blood.

Internal secretion of the uterus.

It has been stated that many of the results of oöphorectomy are due to interference with the vascular or nervous supply of the uterus, and that it is the uterus which maintains the nutritional activity of the genital organs. This theory has not been proved by any direct experimental evidence. Zweifel and Abel maintain that if the uterus is entirely removed atrophy of the ovaries takes place and menopausal symptoms occur. If the uterine mucosa is left in position menstruation may continue, so that the functional activity of the ovaries depends upon the uterus. Doran quotes two cases of menstruation occurring after oöphorectomy. Mandl and Bürger believe that after hysterectomy the ovaries degenerate. Blair Bell asserts that menstruation and ovulation are dependent upon the internal secretion of the uterus. Bond thinks that the secretions of the uterus and ovaries are mutually antagonistic, and that removal of uterine secretion by hysterectomy causes hypertrophy of the ovaries. Carmichael and Marshall carried out a series of experiments in which they removed the uterus in rabbits but found no subsequent change in the ovaries. In their experiments upon the effect of oöphorectomy they found that uterine atrophy occurred in every case. These conclusions I confirmed by a series of experiments upon rabbits and found no change after hysterectomy, formation of follicles and corpora lutea taking place normally. Clinically it has been observed that the menopausal symptoms after oöphorectomy are less severe if the uterus or a portion of the uterus is left *in situ*, but this is explained by the theory that the uterine mucosa is the main channel for the excretion of metabolic products which owe their origin to the stimulation from the internal secretion of the ovary. That the uterus has a direct effect upon the ovaries themselves there is no evidence experimentally.

SUMMARY.

The ovary has a dual function—the production of ova, and the elaboration of an internal secretion or secretions. It is of the nature of a ductless gland, carrying out its function independently of its vascular or nervous supply.

The ovary controls the nutrition of the genital organs and mammæ. Removal of both ovaries before sexual maturity causes an arrest in the development of the genital organs and mammæ, prevents the onset of menstruation or pro-œstrum. The infantile type is maintained and the secondary sexual characters are not well marked. Retardation of the ossification of the long bones has been observed. There is no effect upon the growth and general nutrition (Carmichael and Marshall).

Removal of both ovaries after sexual maturity causes atrophy of the genital organs and mammæ, cessation of menstruation or pro-œstrum, and increased deposit of fat. Removal is frequently followed by certain nervous phenomena characteristic of the menopause.

Removal of both ovaries during early pregnancy causes abortion to take place.

Removal of one ovary causes compensatory hypertrophy in the remaining organ independent of pregnancy or œstrus. Abortion does not take place as a consequence of removal of one ovary.

The corpus luteum is concerned with the embedding and nutrition of the ovum and with metabolism. It controls the blood supply of the uterus. The interstitial cells are increased in size during pregnancy and œstrus and are concerned with the nutrition of the genital organs and the internal secretion of the ovary.

Transplantation of ovarian tissue after castration prevents the occurrence of atrophy in the genital organs and the cessation of menstruation.

Menstruation depends entirely upon the presence of ovarian tissue. It is a preparation on the part of the uterine and tubal mucosa for the reception of a fertilised ovum and corresponds to the period of pro-œstrum in animals. The menstrual discharge is the evidence of metabolic processes by means of which some unknown chemical substances are eliminated from the organism. Menstruation begins at puberty, and ceases at the menopause when the ovaries become atrophied. It ceases after removal of both ovaries, but can be made to recur by transplanting ovarian tissue into another situation. The correlationship between menstruation and ovulation is unknown.

The nutrition of the uterus is dependent upon the presence of ovarian tissue. Removal of uterine secretion has no effect upon the ovaries.

Ovarian extracts have been found of use in the treatment of

chlorosis, amenorrhœa, obesity and menopausal symptoms. Much depends upon the condition of the ovaries from which the extracts are prepared and the mode of preparation. Most clinicians agree that the extract of the corpus luteum has the most therapeutic value.

Information as to the influence of ovarian secretion upon metabolism is as yet unreliable. Ovarian secretion is said to prevent the onset of obesity, and to increase the respiratory interchanges. Most observers agree as to no change occurring after castration in the nitrogen metabolism. Several authors maintain that the ovaries have a marked influence upon the excretion of calcium (Blair Bell).

Retardation of the coagulation period of blood has been found in diminished ovarian function (Adler).

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Menstrual Molimina.

By Catherine Chisholm, M.D.

"Even in health some degree of fulness and of general lassitude is usually felt just before and for the first two or three days of the period."—Galabin.

"All women, even while enjoying good health, feel unwell—as they themselves call it—at the menstrual period."—*System of Gynæcology*, edited by Clifford Allbutt.

These two statements give the opinion held by the writers of most of the text-books of gynæcology. This opinion then is widely spread and appears based on good authority.

The writer of this paper, while investigating the health of a large number of girls of the middle classes, was struck by the number of girls who, having commenced to menstruate, disclaimed any disturbance at the menstrual period.

The belief in the constant association of menstruation with pain and discomfort may often be responsible for the neglect of minor ailments and sometimes for the neglect of the early symptoms of major ones.

It therefore appears that an enquiry into the nature and extent of menstrual disturbance in girlhood should be useful. Particularly will this be so if the results are compared with the statistics obtained from adult women. In this way one may learn if menstrual disturbance is constant or if it increases.

If the disturbance among girls in whom menstruation is establishing itself is absent, it is fair to conclude that the connection between menstruation and pelvic or general disturbance is not inevitable.

If the disturbance is greater among adults it is fair to conclude this is due to some later developed pathological condition.

An inquiry into the circumstances of the affected cases may also show the possible causes of the development of pain.

When so many women have to work for their maintenance it is important that the facts of their capacity or incapacity for work should be known and that anything which may regularly impair their full fitness for work should be corrected if possible.

Before it was known by careful scientific observation that menstruation was accompanied, or rather preceded, by a gradual rise of temperature and an increased output of urea, calcium and glycogen—that is, before it was known that menstruation was part of a general metabolic change, various phenomena were recognized as

frequently accompanying that function. Authors writing on the subject expressed themselves as in the two quotations given above. Kelly, in his *Medical Gynæcology*, says: "Entire absence of suffering is indeed so unusual that text-books of gynæcology all devote some space to what is called menstrual molimina—that is to say, those general and local disturbances which it is assumed most habitually attend menstruation."

Croom describes the disturbances thus: "They experience some pelvic discomfort or inconvenience associated with general malaise; some indefinite pains in the back or loins and a certain irritability of temper; that a woman should not be thus affected would be almost abnormal."

Stanley Hall gives a wonderful and amazing description of the emotions and mental attitude of the woman so affected: the experience of women in this country from whom information has been sought leads one to believe that the American woman he describes must be very different from the English one.

That there should be definite and frequent statements made about menstrual disturbance show that pain, headache, tiredness, pelvic congestion and the other symptoms which are described, are frequently met with.

It is, however, a fact that it is the general rule for such disturbances to occur, and is it inevitable that pain and discomfort should attend menstruation?

An enquiry into the symptoms accompanying menstruation presents many difficulties.

It is, first of all, necessary that the enquiries should be made among large numbers of healthy women. It is obviously useless to try and collect such information from hospital patients—more particularly from patients suffering from gynæcological abnormalities.

Information from healthy women, especially young women and girls, is not easy to collect. The subject is one which is naturally treated with great reticence.

The difficulty of gaining exact information is increased by the lack of a standard by which various cases can be compared. In such cases the personal index is an important factor. No one but the sufferers can estimate the amount of pain. The same amount of pain may prostrate one person which another may bear whilst pursuing her normal life. Where, however, discomfort is stated not to exist, this factor can scarcely be said to affect the comparison.

Further, we have to consider the effect of the generally accepted idea that suffering at such times is normal. Such an assumption may have the force of suggestion in making a woman feel more indisposed than she would otherwise be. Or again, may tend to make her consider any temporary indisposition to be due to co-

existing menstruation. The tendency is to blame any indisposition, malaise, sickness, headache in the preceding days, the days of the period and sometimes for a day or two afterwards, to menstrual disturbances. Where menstruation takes almost a week there is but little time, comparatively speaking, during which disturbances cannot be assigned to the effects of menstruation. It is stated that menstrual disturbances are unknown among savages.

The writer has had the opportunity of making enquiries from several hundred girls, socially of middle-class life, who were being medically examined according to the routine of their school. Their ages varied from ten years old to twenty. Of these girls, the records of five hundred who have commenced menstrual life have been analyzed, and appear in the accompanying tables. The cases were not selected, but taken consecutively.

The object of the investigation was to ascertain—

(1) The amount of conscious menstrual disturbance.
(2) The nature of the disturbance.
(3) If possible the cause of the disturbance.

The girls were asked—

(1) The age at which they commenced to menstruate.
(2) The periodicity and regularity of the flow.
(3) The number of days the flow lasted.
(4) The presence of pain, headache or other disturbance.
(5) The position of pain, if present.
(6) The intensity and character of the pain.
(7) The time the pain lasted.
(8) Whether the flow was unduly profuse.

The girls answered the questions put to them freely, clearly and without hesitation. Care was taken in making the enquiries to ask no leading questions. If, however, pain or other inconvenience was denied, a further enquiry as to the presence of tiredness or headache was made. In this way it was hoped to get as accurate an account as possible, without causing morbid interest in the function among the girls themselves.

Stanley Hall, in commenting on similar enquiries made in America, says, "that the girl knows well if she confesses pain or ill-health it may contribute to increase the prejudice against the cause of education which she has dearly at heart, and normally is as reluctant to confess illness as a boy is to confess to muscular weakness." He is here, however, speaking of college women. There is no reason to suppose the girls examined by the writer had any wish to make light of any aches or pains which they might suffer. Every opportunity is given by the school authorities for rest at home for a day or two, or even longer, during the period time, if it is necessary,

and no stigma whatever attaches to them for abstinence from drill or games at such times. The impression of the investigator is that any disturbance was freely and naturally mentioned.

When the tables were drawn up attention was directed to the abnormalities which might be expected in a function which was establishing itself, viz.:—

(1) Regularity of the flow.
(2) Disturbance caused by the flow.

Regularity.

It is undoubtedly a fact, as has already been stated, that a very large number of cases begin with a slight irregularity. That is, the flow will appear, and the next time will be two months or six weeks later, or the flow may be irregular for a few months, or even absent completely for some months. But that this irregularity does not last long is shown by the comparatively small number of girls who stated they were irregular: 81=16·2 per cent. The regularity of the function is quickly established. That is, it is established within certain limits. Very few (33=6·6 per cent.) of the girls could definitely say how long an interval elapsed from the beginning of one period to the beginning of another. Probably this ignorance is due to a wholesome lack of curiosity about the matter.

General Discomfort and Pain Accompanying Menstruation.

The incidence of pain of any kind accompanying menstruation in the girls examined is interesting, in the numbers not affected by pain or discomfort, and in the manner in which those who were so affected suffered.

In 293 cases, *i.e.*, *58·6 per cent.*, there was *no disturbance* of any kind admitted.

If we add to these the cases of *14·4 per cent.* of only *slight* and *occasional pain*, and *19·2 per cent. of such slight pain*, as can only be described as little more than discomfort and which never interrupts work at all, it is evident that normal menstruation in young girls is accompanied by slight, if any, pain.

The cases of *severe pain* lasting for periods of time from a few hours to two or three days were *39*=7·8 per cent. In *nine* of these cases the pain, occasionally or always, was *incapacitating* for one or more days.

These figures are much more favourable than those of Giles. He gives 35 per cent. with no pain, 36 per cent. with little pain, and 29 per cent. with severe pain. He states that his figures are taken from the early years of menstruation, but he does not state the

social class of the girls or whether he takes his cases from hospital cases or healthy women.

A comparison of the different situation of the pain helps the elucidation of the question of what most frequently causes the pain in young, healthy, normal girls in comfortable circumstances.

The pain, where its situation was definite enough to specify—*i.e.*, was greater than a vague aching around the pelvis—was found in the following situations:—

Abdomen	74=35% of cases of pain.
Back	13=6·3% ,, ,,
Back and front	13=6·3% ,, ,,
Back and hips	1
Hips	5
Groins	4
Groins and left side	2
Left iliac fossa	2
Iliac crest	2
Left side	3
Legs, back and side	1
Headache	10
Head and abdomen	4
Abdomen and breast	1
Side	1
Vomiting was present in	4
Faintness ,, ...	1

Indefinite pain and aching, mostly slight discomfort in pelvis, 32 per cent.

This table of where the pain was felt may well be supplemented by another, showing how long the pain lasted where definite time was given:—

Time pain lasts.	*No. of Cases.*
Indefinite time before	22
Indefinite time before and first day or first hours	4
Indefinite time before and first and second day ...	1
One hour	4
Few hours	15
First day	72
First two days	27
Second day	5
First three days	6
Third day	1
Last day	1
First and last	1
Middle days	2

It is evident from the situation of the pain that menstrual disturbances are of two classes—

(*a*) Cases where the disturbance is due to the general metabolic changes of which menstruation is only one manifestation. Such cases seem principally of vasomotor origin or at any rate to be largely affections caused by abnormalities of the nervous system, and particularly of the sympathetic nervous system. Such are the cases of headache, vomiting, sickness, irritability, mental emotion.

(*b*) Cases where the disturbance or pain is referred to the pelvis. Local pain, felt in organs of whose action under ordinary conditions the individual is unconscious, is due to (*a*) undue compression of nerve terminations, such as we get in the congestion of an inflammation; (*b*) to an exaggeration of the normal muscular or functional activity, as in palpitation, peristalsis or labour pains; or (*c*) it is caused by an excited or excitable condition of the central nervous system, which causes a normal stimulus or sensation to be felt in an exaggerated degree.

(*a*) *General Disturbance.*

It is clear from the table that the girls do not frequently complain of the general symptoms of headache, vomiting, faintness. They will seldom suggest they feel general lassitude. None complained of melancholia or irritability of temper. One mother, herself highly neurotic, stated that her daughter was at these times hysterically inclined. The daughter—it is fair to add—denied any such emotion.

One of the cases since the list was compiled suffered from amenorrhœa, and developed marked melancholic symptoms. Dr. Shiela Ross, in a communication to the *Journal of Mental Science*, April 1909, has pointed out the connection in mental cases of amenorrhœa, with those forms of mental disease where physical ill-health is most clearly shown, *i.e.*, melancholia, confusional insanity, acute delirious mania and general paralysis of the insane.

(*b*) *Local.*

The greater number of cases then complained of local rather than of general pain.

Local pain is either (1) aching in character, or (2) colicky.

As will be seen from the table, an aching abdominal discomfort felt between the umbilicus and pubes, but chiefly immediately below the umbilicus, was most common. The questioner was struck with the remarkable frequency with which girls, when questioned, instead of answering, put their hands in a central position just below the umbilicus. Such pain is probably due to uterine congestion. (See Head's figures of referred pain.)

Some few cases had pain in the sides and pain in the groins and down the legs. Such cases are probably due to general pelvic congestion.

Cervical pain is, according to Giles, referred to the back, and some cases where pain is in this position might be due to congestion round the cervix or to inco-ordinated action of uterus and cervix.

Local pain is caused by (1) congenital or developmental conditions of the local organs; (2) acquired condition of the local organs.

Developmental Abnormalities.

Rossi Doria considered that cases in which menstruation commenced very early or began late were associated with abnormalities of development. Abnormalities of development are supposed to be associated with menstrual disturbance.

With the exception of one early case, which began with pain at ten years of age, the age of commencement of those having no pain is spread over more years than either the age for those having slight or for those having severe pain. Therefore, whether or no late development is associated with abnormal pelvic organs, those commencing at sixteen and seventeen seemed more rather than less free from disturbance or pain.

That the large majority of menstrual disturbances cannot be due to abnormal development is clear on comparing the adult cases which I collected later, where it will be seen that a great many cases which develop pain do so some years after the commencement of menstruation. Therefore they must be due to some later developing condition.

Ovarian Causes.

As ovulation does not regularly occur at the time of menstruation, it is unlikely that, apart from the general pelvic condition in which they share, the ovaries are a general cause of menstrual pain. If they are prolapsed with menstrual congestion they may become painful, and the regular occurrence of pain every other month—of which complaint is sometimes made—can scarcely be caused otherwise than by ovulation in one ovary, which, for some reason, causes pain, occurring at alternating menstrual periods. It is likely also that the phenomena of *Mittelschmerz* or pain half way between the periods (of which no case occurred in the series under consideration) may be caused by ovulation occurring between the periods.

In one of the cases accompanied by severe—sometimes incapacitating—pain, which the writer had the opportunity of examining, a prolapsed large and tender ovary was the only abnormal symptom. It may be that the congestion accompanying menstruation was the ultimate factor in bursting the Graafian follicle in that case, and that in the prolapsed condition of the ovary this caused the pain.

Uterine Causes.

The consideration of the anatomy and anatomical surroundings of the uterus, a vascular organ richly supplied with tortuous vessels supported in its position largely by the perivascular tissue of numerous tortuous valveless vessels surrounded by nerve fibres shows the possibility of pain arising when the circulation is sluggish and when the changes coincident with such a sluggish circulation supervene: with the advent of the monthly congestion aching pain due to extra pressure in varicose vessels, would be expected, till relief comes with the menstrual flow.

Rhythmical Contractions.

The question whether rhythmical contractions of the uterus coming into consciousness cause menstrual pain is interesting. Cushny (quoted by Marshall) states that experiments show constant rhythmical contractions in the uteri of animals which have borne young, but in the virgin uterus there do not appear contractions unless a foreign body is present to stimulate them. Will normal menstruation cause such contractions, or will they only occur when there is narrowing or obstruction to the passage through the cervix?

Malposition.

Pain may be induced by malpositions (prolapse, retroversion, anteversion), by which the vessels may be kinked or where passive congestion may result. Here one would expect aching pain referred to the abdomen.

If, however, the congestion leads to a swelling of the internal mucosa it is possible that in cases of flexion there is obstruction at the internal os to the passage of blood outwards, and that an extra powerful contraction of the uterus becomes evident to the consciousness as pain. This pain will be of a spasmodic or colicky character. So in a small conical cervix, often found with anteflexed uterus, congestion possibly causes obstruction. This is denied by many gynæcologists, who find in the intermenstrual periods that a probe may readily be passed inside. But it seems possible that the congestion of menstruation may so obstruct the passage that it will require painful contractions to overcome the resistance, even where a hard mechanical instrument can be inserted readily in the uncongested condition when the uterus has been straightened by pulling on it with a volsellum. Or it may be that there is incoordination between the muscles of body and cervix through interference with the ganglia at the internal os. It is not inevitable for pain to occur in these cases of infantile anteflexed uteri, but it is frequently found that this condition is present in cases of spasmodic pain occurring regularly from the first menstruation.

Membranes and Clots.

Spasmodic pain, often of very severe character, is found associated with the passage of clots and membrane.

Croom denies the passage of true membrane, *i.e.*, casts or portions of casts of the uterus by the virgin uterus. This, however, is incorrect. Many virgin uteri extrude pieces of clot and membrane, and the writer has seen several cases where casts of the uterus were extruded, though none are included in the series presented. Several cases, however, of the passage of clots are included. As in some cases of anteflexion and narrow cervix pain is not present, so the passage of clots is not always painful. But this formation of clots does appear to assist in the development of pain in later years in cases of persistent profuse menstruation.

Profuseness of Flow.

Contrary to expectation was the small number of girls who suffered from profuse loss at the period. This one is accustomed to think of as one of the most common of early menstrual abnormalities. The cases met with in the consulting room are often overgrown, lanky, flabby, thin girls, who are very anæmic. Profuse menstruation one expects in weakly children. The uterus being so vascular an organ and one in which the muscular tissue is growing quickly, may have an abnormal disproportion between the muscular and fibrous tissue when menstruation commences. According to Dr. Clarke, the muscular tissue of the uterus increases from 52 per cent. at the time of the appearance of the permanent teeth to 62 per cent. at the age of fourteen. That is, there is an " increase of 19·2 per cent. in total bulk of muscle." That increase appears to be greatest at the time of puberty. Between fourteen and twenty-one there is a further increase of muscle tissue to 65 per cent. compared with fibrous tissue 35 per cent. It is evident that just at puberty the muscular development is exceptionally great. The musculature of the uterus controls the hæmorrhage by compressing the vessels. It is obvious that menorrhagia will result from deficiency of muscular tissue. Anæmia then follows if the condition is not watched, and a result is a further weakness in muscular power. Hence a vicious circle is formed.

Only 32 cases, *i.e.*, 6·4 per cent., had undue profuseness of flow. They were not, however, among the most delicate children in the school. In weight they compared well with the average child. They were always encouraged to stay at home during the first days of the period, and those who did so, and whom the writer was able to watch, generally were soon able to resume the usual course of attendance at school. A larger proportion of these girls than of others suffered from menstrual pain.

Such cases of profuse menstruation often begin painlessly and

develop pain later. Granted that the hæmorrhage commences because the vascular supply develops more quickly than the muscular and that the uterus does not contract quickly enough or firmly enough to control the hæmorrhage, each menstruation, unduly draining the system, causes a further weakening of uterine muscle, which becomes so feeble that it does not expel the blood till a clot is formed by the blood becoming unduly profuse for the alkaline uterine discharge. The uterus treats this as a foreign body, and contracts forcibly in order to get so large an obstruction through the cervix.

The nervous system also, as a result of the hæmorrhage, is more sensitive, and the resulting contraction is more severely felt than under normal circumstances. The pain adds to the nervous exhaustion and makes the patient more prone to feel pain next time, and thus a habit of pain is formed.

Further, profuse menstruation is often the result of small submucous fibroids or pedunculated polypi, and these also may cause uterine pain of a spasmodic character.

Effect of General Health.

One would expect the more vigorous in health to be more free from menstrual disturbance than other girls.

Puberty is often spoken of as a period which is especially trying to the general physique.

The American gynæcologist particularly is anxious for the girl to have especially easy work during the developmental years, and often advises absence from school for a year or at least during the days of the period.

As a matter of personal experience one finds that it is much more usual for children who have been delicate suddenly to shoot up and develop into fine girls than for girls to become more fragile. Obviously there are exceptions who decidedly flag in health at this time. That puberty is seldom so disturbing to health as to cause absence from school is shown by the fact that during three years only 21 children, from a school containing 550 girls, were absent for a term or more because of any illness other than an infectious disease. Of these, three were absent for operations for appendicitis; one was away for chorea; seven were absent with chest or glandular mischief. This leaves ten children in three years who were absent during the years of adolescence for undefined reasons of health.

Even these absentees are probably not all due to the strain of adolescence. These statistics therefore appear to show how little ill-effect this transition phase causes, even under educational pressure, if that pressure is carefully supervised.

As far as could be done, an attempt was made to discover if statistics of menstrual disturbance varied with those of general

health. Body weight and the condition of the blood were conditions which could be exactly tested.

Chlorosis.

The records of two hundred girls who had their blood examined to discover the percentage of hæmoglobin present were examined. The blood was tested by means of Tallqvist's hæmoglobin scale. The test is not very fine, but gives a satisfactory result. The records showed that of the 23 cases which had under 80 per cent. of hæmoglobin, 13, *i.e.*, 56·5 per cent., suffered from some amount of discomfort. Four of these cases, or under a third, suffered severe pain. That is, the percentage of chlorotic girls with menstrual disturbance was higher than the general average.

Weight.

Further, the weight of the girls was tabulated according as they compared with the average weight of girls of their age as given in the Anthropometrical Societies' Tables of 1884. It was impossible to compare the actual weights as the ages varied. The cases were then collected into three sets, consisting of girls of under-weight, average weight and over-weight. Fifty per cent. of the girls were over-weight; 13 per cent. were exactly average weight; 37 per cent. were somewhat under-weight. Though as the weights were taken when the girls were clad only in dressing-gowns, and the above-mentioned tables are of children fully dressed, the figures are really even better than they appear.

When the percentage of those who suffered pain in these different classes was compared no marked difference was observable. There was one group of girls, however, which seems to show that excellence of physique and entire absence of disturbance are related. This group is the class known as the seniors. These girls, to the number of 64, have been observed for three years. They are girls between the ages of seventeen and nineteen, and they are the pick of the school physically and mentally. They appear year after year in their progress through the school on an average taller and heavier than children in classes doing corresponding work but not of so high a standard. In the year before they leave school, when examined for the last time, they are competing for scholarships and for school leaving exhibitions, and are subject to hard pressure. They, as a rule, individually and as a class, excel in games and gymnastic exercises. Of these girls, 29·6 per cent. only suffered any menstrual disturbance. Only three had pain which could be described as severe. One of these had only occasional pain lasting two or three hours, and the other two were the most delicate ones of the set—one anæmic, one with tubercular tendencies. None had incapacitating pain.

We may also infer from these girls that hard mental work under healthy conditions with plenty of opportunity for exercise does not affect the causation of pain.

Conclusions.

It therefore appears:

1. That the majority of girls commence menstruation painlessly.

2. That a number have discomfort, some occasionally, some regularly for a time varying from one hour to two days just before and with the commencement of the menstrual period. This discomfort is often slight in character.

3. That a few have more severe pain, either regularly or occasionally. A very small number, *i.e.*, 1·8 per cent., are incapacitated.

4. That a small number, *i.e.*, 1·2 per cent., have discomfort or pain for a longer period than one or two days during the whole time of menstruation.

5. That the discomfort in girls is most frequently local in character, and when there is serious general disturbance it is accompanied by severe local pain, and probably proceeds from some local abnormality congenital or acquired.

6. That the best developed girls appear less likely to have menstrual disturbance.

7. That this freedom from discomfort is not affected by hard mental work carried on under healthy conditions.

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Localizing Peritonitis of Puerperal Origin.

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I do not think that localizing septic peritonitis, the sequel of sepsis occurring within the puerperal uterus, has received a proper amount of attention. In this short paper it is my intention to touch upon a few clinical and pathological points which may help in deciding the proper form of treatment.

In the history of each case there will be the evidence of some intrauterine sepsis during the puerperium. This infection may be slight and only last a few days. The lochia may have been foul, accompanied with more or less pyrexia. These symptoms usually clear up on appropriate treatment, but after a varying interval the temperature rises again and is now accompanied with abdominal pain. At first the diagnosis may be very difficult, for it may be some time before there is sufficient exudation to form a definite mass. The patient in the meantime becomes worse. The pulse is rapid, and there is occasional vomiting. Most often at this stage a large mass forms quickly in the retro-uterine pouch. Both Fallopian tubes have become infected and a loculated abscess has formed in the pelvic peritoneum.

Now, all of us would agree that the treatment of such a case is as simple as the diagnosis. The abscess should be opened through the posterior fornix. It is wonderful how quickly these patients improve after this simple drainage, and it is still more wonderful to what an extent the Fallopian tubes and the peritoneum recover. I have seen a huge loculated puerperal abscess opened and drained in this way, and had the opportunity of opening the same patient's abdomen about a year later. On looking into the pelvis the tubes were quite free, and there were merely a few delicate adhesions attaching the ovaries to the back of the broad ligaments.

The chief cause of anxiety in dealing with puerperal abscesses is the character of the infecting organism. The streptococcus is a most poisonous germ, but it does not cause as much permanent damage to structures as does the gonococcus. Cases in which there is a large pelvic exudation are simple enough to deal with, but unfortunately there are others where the infected area is not so easily got at, nor is the diagnosis so simple.

There are two main channels by which infection may reach the peritoneum from a septic uterus. The most usual course is *viâ* the

Fallopian tubes, but in quite a number of cases the infection spreads along the lymphatics of the broad ligament. Now, if the tubes become infected while the uterus is still big, a localized collection of pus may form in a position which is quite out of reach, as far as drainage from below through the pouch of Douglas is concerned. One tube may have become infected and may form a nest of pus even at the level of the umbilicus far back among the omentum and coils of intestines.

Again, an ovary may become infected *viâ* the lymphatics of the broad ligament. A metastatic abscess forms within the ovary and sets up a local peritonitis with all the accompanying symptoms of pent-up pus within the peritoneum.

Let me here give shortly three examples to illustrate my meaning:—

A patient had a premature labour which was followed by some septic uterine trouble. She got better, but after a few weeks she complained of pain just below the umbilicus. The temperature rose every night; there was marked leucocytosis. There was some tenderness and a little rigidity below the umbilicus. She was wasting rapidly. After three more weeks a diagnosis of appendicitis led to an exploration, and the right Fallopian tube was found with its fimbriated end embedded in a small abscess in the folds of the omentum about on a level with the umbilicus. This case was not mine, but I believe she recovered after a stormy convalescence.

2. Mrs. W., æt. 32, suffered from pyrexia and a foul lochia during the early part of the puerperium. The temperature was irregular and settled down to normal on the fourteenth day. The patient then got up and went about her work. She did not, however, feel strong, and on the 21st day of the puerperium was attacked with pain in the region of the left iliac fossa. The temperature rose to 100°. The pyrexia and pain continued, and after about a week she came under my care. She was wasting rapidly; she could not sleep, and the pain was intense. On examination there was tenderness over the pubes, especially on the left side. There was some rigidity. Bimanually the uterus seemed slightly enlarged and rather fixed. High up in the left fornix an indefinite tender lump could be felt. I had not much doubt that there was some septic puerperal focus high up at the pelvic brim on the left. Drainage from below was out of the question, for one would have had to cross an open retro-uterine pouch, and, further, it was impossible to make out for certain what the actual lesion was. I decided to wait in the hope that the virulency of the infecting organism might abate. The temperature gradually came down, but the pain and wasting continued. After waiting a week the temperature rose again at odd times to about 100–101°. The pulse kept rapid at about 110, and the general condition of the patient remained about the same. I knew that we must get at the

focus by abdominal section, and if one carefully watches these patients, it is best to wait. The streptococci and other organisms which inhabit these local puerperal collections always cause a general upheaval, if they are disturbed too soon. After waiting more than three weeks, I decided to attack the condition, and I found a most interesting and instructive state of things within the pelvis. Both the Fallopian tubes were quite normal and free. The right ovary was also unaffected. The left ovary was lying over the left sacro-iliac synchondrosis and was very adherent to the gut and the back of the broad ligament. The broad ligament on the left stood up like a stiff partition. It was about 2½ inches thick at its base and about ¾ inch thick at its top. This thickening was due to œdema, and there was no pus in the cellular tissue. Obviously the left broad ligament had become infected and the lymphatics had carried the sepsis to the ovary. The ovary was about the size of a Tangerine orange, and in its interior was an abscess the size of a walnut. The walls of the abscess were ½-inch thick. As such things go, there was not much difficulty in removing the ovary. In doing so the ligatures had to be placed in the œdematous broad ligament, and the connection with the ovary severed. I was able to get the ovary out intact so that no pus escaped. Knowing from past experience that a surgeon should always regard a local puerperal abscess of this kind as a piece of dynamite, I put in a large drainage tube which was sucked up with a syringe every six hours, and the patient was placed in the complete Fowler's position. The patient became very ill, not from peritonitis or intestinal complications, but from general septic poisoning. After about five days the temperature came down gradually and she made a good recovery.

Now contrast this case with the following:—

A young primipara was taken ill with pain and vomiting on the 14th day of the puerperium. Previously the temperature had been raised to about 100, and the lochia had been offensive. I saw her on the 17th day of the puerperium. She was fairly well in her general condition, but her pulse was 110, the lower part of the abdomen was slightly distended, rigid and tender. On vaginal examination there was not much to be made out, except high up on both sides there was tenderness and some indefinite sense of resistance. The diagnosis was simple enough, for she no doubt had a fairly large area of peritonitis. She came into the hospital, and for a few days seemed to improve, but soon became worse again. I could then feel definite masses high above the posterior fornix on both sides. I waited a few days longer in the hope that she might settle down, but this was not to be. On opening the abdomen both tubes were found dilated and full of pus, and both broad ligaments were thickened and intimately blended with the tubes. I was able to clear the tubes and the pus away, but again in doing so one's line

of sutures had to pass through the œdematous broad ligaments. The patient was extremely collapsed after the operation, but after a few hours became warm. Next day the bowels were open, and there was no distention or vomiting. Free drainage and Fowler's position had been adopted. After a brief improvement the patient's temperature and pulse rose, and she died on the third day after the operation from an unmistakable condition of acute septicæmia. There were no signs or symptoms of peritonitis, and it is quite clear that the bacteria of the infected area were let loose and were picked up by the freshly opened and dilated lymphatics of the parametrium, the result being that a fatal dose obtained admission into the blood-stream.

I have other cases, but these three will illustrate what I have learnt in the treatment of these cases, and, as far as my experience goes, I do not know of any other class of case which requires so much care and judgment in deciding when and how to operate. No doubt, the infecting organisms in case of subacute gonorrhœal pyosalpinx are of a very benign character, but to apply the same idea to a puerperal infection would certainly lead to disaster.

In all such cases the peritoneum cannot be too freely drained after removal of the infected organs.

In treating cases of local peritonitis, following a septic puerperium, I have come to the following conclusions:—

1. Simple drainage through Douglas's pouch should always be adopted when the local area of infection is within reach.

2. Any attempt at radical removal of a pyosalpinx or an infected ovary is certain to be followed by a severe general septic condition which may be quickly fatal.

3. The parametrium is nearly always also infected, and, although the broad ligaments may not contain pus, the lymphatics are in such a state that they will pick up bacteria readily if opened in the course of removal of the tubes or ovaries.

4. In cases where simple drainage is not possible it is best to wait. The patient must be watched carefully for any signs of extension of the infection. The longer one waits, the less virulent will be the organisms, and, further, by waiting the natural protection against a general invasion may have time to develop.

5. In all cases Fowler's position should be adopted.

6. The complications to be feared if a radical operation has been undertaken are not the ordinary complications which are familiar to all surgeons engaged in abdominal work, but septicæmia in its worst form.

SELECT CLINICAL REPORTS.

(Under this heading are recorded, singly or in groups, cases to which a special interest attaches either from their unusual character or from being, in a special sense, typical examples of their class.)

Pelvic Hæmatocele from Rupture of a Blood Cyst of Ovary.*

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It has been the tendency to consider all hæmorrhagic effusions into the female pelvis as a consequence of some form of ectopic gestation. Recent researches, however, by reliable observers have clearly shown that in rare cases the cause of pelvic hæmatocele may be quite distinct from the presence of pregnancy. Fritsch's assertion that hæmatocele and the rupture of an ectopic pregnancy are synonymous no longer holds good.

Winckel drew attention to a varicose condition of the veins in the broad ligament as a likely cause of hæmatocele, especially where the veins are thin-walled and prone to rupture under increased pressure from whatever cause. Hoering has published a case which would come under this category. Virchow showed that an altered condition of the peritoneum is an etiological factor—a condition described by Bandl as "pelvic peritonitis hæmorrhagica." Doubtless forcible attempts to replace a fixed retroflexed uterus is a not infrequent cause of pelvic hæmatocele.

More recently, fibromyomata of the uterus have been noted, associated with, in some cases, fatal intraperitoneal hæmorrhage as a consequence of the rupture of a subserous varix. Wallace described such a case and collected others of a similar nature.

In the *Archiv für Gynäkologië*, vol. lxiv, Gabriel contributes an article on the ovary as a source of intraperitoneal hæmorrhage. He quotes Jousset's collection of 28 cases, in six of which the ovary was found, on post mortem examination, to be the source of the bleeding. Schroeder, in his text-book, refers to three similar cases, and Leopold also published three cases where hæmorrhage into the stroma of the ovary produced an hæmatocele.

* Communicated to the Edinburgh Obstetrical Society, March 12, 1913.

From a study of the reported cases it would appear that the ovary has been found to be the source of hæmatocele in three ways—firstly, from the rupture of a Graafian follicle; secondly, from an ovarian hæmatoma; thirdly, from the rupture of a hæmorrhagic ovarian cyst.

Of the first group, Cranwell reports a case where there was free intraperitoneal hæmorrhage arising from a small aperture on the surface of the ovary corresponding to a ruptured Graafian follicle. Similar cases have been described by Hulpher, Weinwarter and Haig Ferguson.

Of the second group—rupture of an ovarian hæmatoma—cases have been reported by Joyle, Edgar and Kossman.

Most of the published cases, however, come under the third group, and the literature contains a number of such cases. Bander reports a case where a patient was operated upon, with all the signs of severe internal hæmorrhage, the cause of which was found to be a small thin-walled ruptured cyst of the ovary. Similar cases are published by Briggs, Donald and Lockyer. The latter reports three cases, where in two the symptoms pointed to appendicitis, and in one to ectopic gestation. In the majority of those cases the possibility of extra-uterine pregnancy could not be excluded.

The following are the notes of a case of pelvic hæmatocele due to hæmorrhage into and rupture of a small ovarian cyst:—

Mrs. D., 38 years of age, and the mother of five children, enjoyed good health until the birth of her last child, 5½ years ago. Since then menstruation has been irregular, occurring at intervals of from three to six weeks, and accompanied by pre-menstrual pain, frequently of a week's duration. In the beginning of September 1912 she had a menstrual period of one week's duration, associated with pain, sickness and general discomfort. Menstruation did not occur again till the beginning of December, although the usual feelings of discomfort were felt in October and November. The menstrual period occurring in December lasted one week, and a fortnight later a brownish uterine discharge commenced and continued till I saw her on January 20, 1913. Between December 20 and January 20 she had six attacks of severe pelvic pain, described by the patient as being labour-like in character. On examination, the patient looked rather exhausted; pulse 118, temperature 99°F. The uterus was enlarged and pushed to the front. Through the posterior fornix there was felt indistinct fullness, and pelvic examination caused her considerable discomfort. To the right of the uterus there was felt a distinct cystic swelling, the size of a lemon, and there was a brownish discharge from the uterus. With the history of recurrent pelvic pains during a period of amenorrhœa, and associated with the presence of a tumour in the pelvis the possibility of extra-uterine gestation could not be excluded, although the consistence of the

pelvic tumour was more distinctly cystic than that generally associated with a gravid tube. Further, the possibility of a uterine pregnancy, associated with a cystic ovary, had also to be considered, although this was excluded by the subsequent history of the case. On January 26 cœliotomy was performed. The peritoneum had the greenish hue often found in intraperitoneal hæmorrhage. On opening it, there was a copious escape of blood exactly resembling what occurs in hæmorrhage associated with a ruptured tubal pregnancy. The left ovary and tube were inspected and both found to be normal. The right tube was likewise unaltered. The right ovary was converted into a cyst of a bluish colour, and at one part of the wall there was a blood-clot protruding through a rent on its surface. There was no evidence of torsion of the pedicle. The cyst was removed, the abdomen irrigated with saline fluid, a considerable amount of blood-clot being removed from the pouch of Douglas. The abdomen was closed in the usual way. The brownish uterine discharge disappeared a fortnight after operation. The patient's condition is now satisfactory. Examination of the cyst showed it to be unilocular, containing blood-clot. Professor Sutherland kindly made numerous sections of the ovarian tumour, but could find no evidence of ovarian gestation.

The interpretation of the case appears to be a hæmorrhage into an ovarian cyst, from which there had been an escape of blood at intervals, and which was the source of the intraperitoneal hæmorrhage.

There can be no doubt that occasionally severe intraperitoneal hæmorrhage may occur from a ruptured Graafian follicle, corpus luteum or hæmorrhagic ovarian cyst, without there being any evidence of pregnancy. It is quite probable, however, that some of the reported cases may have been the result of a ruptured ovarian gestation in the earlier stages. To prove this, however, fœtal structures must be detected, and if the pregnancy has terminated at a very early stage villi may readily escape discovery unless all blood-clot is most carefully examined.

From an experience of 28 cases of intraperitoneal hæmorrhage treated by abdominal section, this is the only case I have had where the presence of pregnancy could, with certainty, be excluded, and in bringing these notes before the Society my object is to ascertain if other members have met with similar experience.

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Case of Obstructed Labour due to Hydrocephalus.

By Sir Francis Champneys, Bart., M.D.

J. T., æt. 40, admitted to St. Bartholomew's Hospital on January 14. The diagnosis outside had been that of acute anteflexion of the uterus in a pregnancy prolonged to eleven months, causing the death of the fœtus.

First pregnancy. Married æt. 38; menstruation regular; last regular period ceased February 14, 1912; since then complete amenorrhœa.

History of present condition. She expected to be confined during November 1912, but had no pain until January 9, 1913, when she began to have pain in the back and hypogastrium. The pain was of a dull aching character, and has been continuous until admission. Since January 12 there has been some greenish discharge, sometimes blood-stained. She says she felt movements on January 9.

January 15. Present Condition.

Breasts. Areolæ size of florin, pinkish; no tubercles; clear secretion expressed from each.

Abdomen. In dorsal position shows a conical shape; apex one inch to the left of the navel. Occupied by a tumour, three-quarters of whose bulk is to the left of the mid-line, extending to the left hypochondrium and disappearing beneath the ribs. It occupies the whole left half of the abdomen and the mesial half of the right half. Its consistency varies. Just below and to the left of the navel, it is hard; above the navel it is elastic; the left flank is elastic, the right side hard; its right limit is two inches internal to the iliac spine. The tumour on the left side is dull; the rest of the abdomen is resonant. In the erect position the shape is much the same; the abdomen hangs somewhat, but is not pendulous. The tumour descends slightly on respiration. No fœtal parts can be felt, nor any retraction ring.

Per vaginam. The cervix is at the usual level, admits two fingers and is dilated down to the external os, which is quite thin. Within can be felt a round globe with a hard plate-like bone, and a wide round soft space. This is movable and elastic. An impulse is conveyed to the body which is felt within the cervix and lying on the brim, by pressure four inches above the pubes.

A diagnosis of hydrocephalus was made, and a trochar plunged into the soft area. Sixty-five ounces of turbid, yellowish, odourless

fluid were removed. After the escape the summit of the swelling was only three inches above the navel. Left hypochondrium resonant. A large, hard mass, like a cranial bone, still presented.

January 15. During the evening and night the patient had no pains, save from a distended bladder, which was relieved by catheterization.

January 16. No pains until 8 p.m. Then irregular aching pain in the back, at intervals of thirty minutes. About 9-30 p.m. she had three strong pains; then the pains became regular. 10 p.m., head on the perineum. 10-30 p.m., the child born naturally; the uterus contracted down well, but the placenta did not separate; some hæmorrhage (slight). 12-30 a.m., under an anæsthetic the placenta was manually removed by Mr. Pulling; it was firmly adherent to the fundus. There was a velamentous insertion of the cord. The fœtus, minus fluid, weighed $6\frac{3}{4}$ lbs., was macerated, slightly decomposing and offensive. It showed all the signs of maturity, none of post-maturity. The skin of the scalp was enormously stretched, the bones being widely separated.

February 3. The patient was discharged in good health.

Remarks.

If the menstrual history gives a correct calculation labour was due about November 19, 1912.

If the patient was correct in stating that she felt movements on January 9, she must have conceived during prolonged amenorrhœa, as the fœtus showed no signs of over-development. If, on the other hand, the amenorrhœa marked the duration of pregnancy, she was deceived about fœtal movements on January 9.

In that case we have here a case of obstructed labour due to hydrocephalus without any serious resentment by the uterus for two months. The usual course is continuous retraction, thinning of the lower uterine segment and eventual rupture.

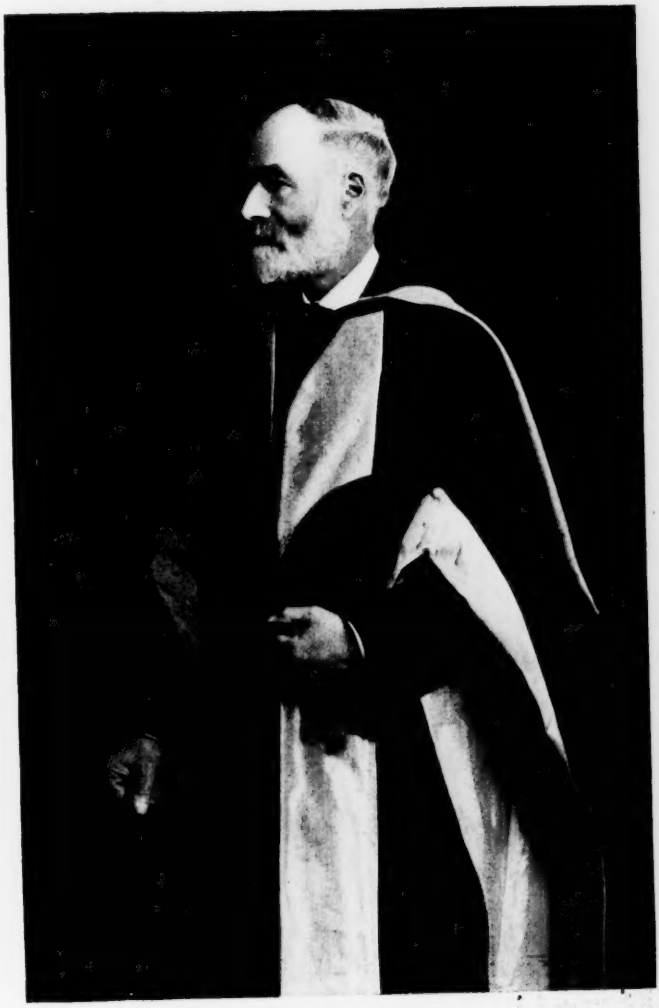
Obituary.

ALFRED LEWIS GALABIN, M.A., M.D., F.R.C.P.,

Consulting Obstetric Physician to Guy's Hospital.

In 1569, three years before the massacre of the Huguenots on St. Bartholomew's Day, one William Chamberlen fled from France and settled in Southampton. He was destined to be the founder of the Asclepiad family, as the inventors of the obstetric forceps modestly termed themselves. In 1685, through what Mr. McCabe, in his *Candid History of the Jesuits* calls the tardy and ill-balanced zeal of Louis XIV, the edict of Nantes was revoked. The nimblest fingers and the readiest wits of France, as Dean Kitchin once said, were driven into flight, leaving in their native country men who, however able or wise they might be, were all more or less spoilt by enforced conformity to a terrible spiritual and political despotism. The fugitives, breathing the air of freedom under the British flag, became the forefathers of many distinguished Englishmen. One exile, a country gentleman dispossessed of his estate at Jonquières, between Carpentras and Orange, in the Department of Vaucluse, was the ancestor of Alfred Lewis Galabin. Jean Galabin had the good fortune to see William III firmly established in Great Britain, and the Dutch sovereign, who took his princely title from the town near Galabin's estate, favoured him and gave him some appointment, on account of which he settled at Greenwich. Shortly afterwards, on the eve of the eighteenth century, a Huguenot named Mignon settled at Plymouth. He was destined to be the ancestor of the wife of the subject of this obituary, a lady with whose loss we all must sympathize.

Thus British obstetrics owes a great debt to past theological strife across the Channel. The services to womankind conferred by the Chamberlens are well known, but the way in which they tendered those services is only too familiar to us. Contrasting them with the obstetrician whose loss we now deplore, we feel that there can be no doubt who, putting the Chamberlens' reputation for originality aside, was the best man, in every aspect of that little word "best," even if it were certain that the Chamberlens were really "original" in respect to their forceps. Not many years ago, when there was much strife and bitterness amongst leaders in British obstetrics and gynæcology, one of the sternest critics of past authorities and contemporary colleagues, Dr. Matthews Duncan, spoke enthusiastically, at a society meeting, of the high accomplishments and diligence



THE LATE ALFRED LEWIS GALABIN, M.A., M.D., F.R.C.P.

of Dr. Galabin and of the special distinction which he had gained on account of his mathematical contributions to the mechanism of midwifery. Duncan recalled Galabin's admirable speech in a previous debate on the production of the shape of Naegelé's pelvis introduced by Dr. Herman, and indeed that speech, preserved in the twenty-eighth volume of the *Transactions of the Obstetrical Society of London* is a model of clearness which all who are accustomed to join in discussions at medical societies would do well to study. For it is based on mechanics and is therefore not out of date, like the ever-changing views of antisepticists, asepticists and bacteriologists. We used the word "speech" because Matthews Duncan himself who joined in the same discussion spoke, in the course of his remarks, of "the great speech or criticism by Dr. Galabin, which he hoped to see fully reported."

Alfred Lewis Galabin was born, on January 10 1843, in Grove Lane, Camberwell, then a pleasant London suburb. His father was in the civil service, and was able to afford his son the advantages of education at a public school and a university. Alfred began his studies at a local private school, but was sent to Marlborough when he had reached the age of fourteen. There he remained for several years, when the school was under the headmastership of Cotton, the future Bishop of Calcutta, and Bradley, afterwards Dean of Westminster. He went up as a minor scholar to Trinity College, Cambridge in 1862, gained a major scholarship on his college foundation, in 1864, and won a Double First in 1866 as twenty-first Wrangler in the Mathematical Tripos, also bracketed ninth in the first class of the Classical Tripos. For this high honour his college awarded him the Wrangham Medal. He was elected Fellow of Trinity in 1868, taking his degree of M.A. in the same year.

Already before his brilliant university career was ended, he began his medical studies in Cambridge. On that account, having studied anatomy and physiology at Cambridge, he entered the Medical School of Guy's Hospital in 1869, and worked at medicine and surgery, becoming clinical clerk to Wilks, Pavy and Moxon, and dresser to Cock and Cooper Forster. In the spring of 1872 he passed the final examination for the membership of the College of Surgeons, and took the degree of M.B. In 1873, when the higher degree of M.D. was conferred upon him at Cambridge, he held the appointment of house physician and resident obstetric assistant at Guy's. In the meantime Galabin had not only begun original work, but was about to make it public. He had gained reputation as a young physician of high scientific genius, and after his term of office on the house staff of Guy's had ended he was appointed assistant physician to the Hospital for Children, Great Ormond Street, and offered himself as a candidate for a vacancy at the Middlesex Hospital.

Just when it seemed as though fate had destined Galabin to be a general physician, a vacancy occurred on the obstetric staff in January 1874. The talented assistant obstetric physician, Dr. John Jones Phillips, died suddenly of cerebral embolism, the result of long-standing cardiac disease, and Galabin was elected to fill the vacancy. He proved a worthy successor to a brilliant line of obstetricians who, from the middle of the eighteenth century, taught in the Borough schools. At first the teachers were pupils of Smellie, Levret and William Hunter. Orme and Lowder were renowned abroad as well as in London. Haighton succeeded Lowder, and both were Presidents of the Physical Society of Guy's Hospital, but were never appointed physicians on its staff. Haighton seems to have resembled Galabin in many respects. He was a man of retiring disposition yet of high scientific abilities displayed on several important contributions to the *Philosophical Transactions* and other archives of learning. Like Galabin, Haighton was highly respected, Conquest recording him, long after his death, as a worthy man who clearly did not recognize his own worth, whilst Haighton's nephew, Blundell, spoke of his uncle as " a man to whom I owe everything that is good both in precept and example." This is precisely the language in which we have heard former pupils speak of their teacher Galabin. Blundell succeeded his uncle as lecturer on midwifery in the United Schools of Guy's and St. Thomas's Hospitals, yet was never a member of the staff of either of those institutions. We must remember, strange though it may seem to us, that the appointment of obstetric physician to Guy's Hospital did not exist in its present form until 1849. Mr. Henry Williams, of the Counting House, Guy's Hospital, has supplied me with the following information, according to official records. Dr. Blundell was appointed to the Chair of Midwifery at the United Hospitals in 1818, and was succeeded at Guy's by Dr. Ashwell in 1834. An obstetric ward was opened in 1831, and the patients, it appears, were attended by the Lecturers in Midwifery to the Medical School. " Upon reconstruction of the Obstetric Department " in 1849, Lever and Oldham were elected, being the first " Obstetric Physicians " so-called and recognized as attached to the Hospital Staff. Then Lever was made the senior and Oldham the junior physician. Lever resigned in 1859, Oldham in 1869; the latter died at an advanced age in 1902. Braxton Hicks, elected as assistant when Oldham was promoted in 1859, became the senior ten years later, when, in 1869, John Jones Phillips succeeded to the junior post. On his sudden demise in 1874 Galabin was elected in his place, as we have already explained; and on the retirement of Dr. Braxton Hicks in 1883, became senior obstetric physician.

Galabin, already recognized as a highly intellectual man who was at the same time a classical scholar and a mathematician, developed other talents not by any means a usual attribute either

of the fluent linguist or the able calculator. He proved a skilful operator, and, notwithstanding his natural shyness, gained the confidence of private patients. He took up his residence, on his marriage in 1874, in St. Thomas's Street, and the year after he succeeded to the senior obstetric appointment he moved to Wimpole Street, where he practised, with great success, for twenty-five years. He resigned his hospital appointment in 1903, and gave up private practice six years later, retiring to his house in Devonshire.

His activity from the beginning was remarkable, even for a hospital teacher. He delivered the usual lectures and instructed his hospital pupils to their great advantage as they never failed to admit, but it was not so much as an orator and as a teacher of youth that he excelled, but rather as a writer of original memoirs and an enlightener of his peers in the profession. His Cambridge thesis "On the Connection of Bright's Disease with Changes in the Vascular System, with Illustrations from the Sphygmograph," appeared in 1873, and another, "On the Causation of the Water-Hammer Pulse," which was published in the *Medico-Chirurgical Transactions* for 1876, proved his merits as a scientific physiologist. In 1875 he exhibited a new form of cardiograph at a meeting of the Royal Medical and Chirurgical Society. He also published papers on the dynamic causes of secondary waves of the pulse and on the application of the sphygmograph to general clinical purposes in the *Journal of Anatomy and Physiology* and the *Guy's Hospital Reports*. Galabin's cardiograph was exhibited before the Lord Mayor at a Mansion House Meeting. Without doubt Galabin played no mean share in establishing the sphygmograph as an instrument of importonce both for diagnosis and for instruction.

Galabin, however, will be remembered chiefly for his writings on obstetrics and gynæcology, especially the former. We will consider first his more purely educational works, admirable of their kind, before turning to the obstetrician's relatively original work.

The *Diseases of Women* was first published in 1881, and its sixth edition was reviewed in the fifth volume of this JOURNAL, in January 1904. Our reviewer recognizes that, like all Galabin's works, it was written throughout with scientific accuracy, clearness of expression, and well-balanced judgment. It was translated into several foreign languages and we have in our possession an edition in modern Greek entitled Ενχειριδιον Γγναικολογιας ὑπο Αλφρεδὸν Λ Γαλαβινου, ἐκ τῆς αγγλικῆς ἐξελληνισθὲν και δι' εἰσαγωγης ἐπανξηθεν ὑπο Λουκα Γ. Μπελλου, published in Athens in 1898 by Dr. Bellos.

Whilst gynæcology was almost overdone in the medical press during the last quarter of the nineteenth century, obstetrics was perhaps relatively neglected, but Galabin was one of the few who never let the latter branch of medical art and science fall behind the former. That was one of the best features in his professional

principles, and as he was also strong in communicating his views to others by the pen it is not surprising that his *Manual of Midwifery* was very soon recognized, after the publication of its first edition in 1886, as a standard educational work. It was seen to be equally suitable to the unqualified student and to the practitioner. It is still current, for, after the sixth edition had appeared in 1904, and was speedily sold out, the treatise was recast, with the co-operation of Dr. Blacker, as *The Practice of Midwifery*, and issued in 1910. This great educational handbook included much of the author's more special and original work, duly rendered digestible for the mind of the learner.

We turn with satisfaction to Galabin's more special and original work which made up so much of the sound foundations of his *Manual*. From the very day that he was appointed assistant obstetric physician to Guy's Hospital he studied the maternity department intelligently and scientifically, so that within two years he was able to analyze over twenty-three thousand consecutive cases of labour, publishing the statistics in his first report of the Hospital Lying-in Charity, which appeared in the *Guy's Hospital Reports* in 1876. Thus by 1886, at the end of a decade, he had at his disposal an invaluable series of perfectly original statistics, which he could temper with more mature experience and fresh statistical material, all ready for the first edition of his *Manual*. He could write with direct authority on the relative frequency and mortality of abnormal presentations and the results of rival methods of treatment.

One of the subjects most intimately associated in our minds with midwifery is the use and abuse of the forceps. The multiplication of patterns of that instrument had become quite a scandal even before the mid-Victorian era, a scandal that has greatly abated since its limitations have been more accurately defined, thanks in no small degree to Galabin's excellent criticism of the history and latest developments of the forceps as embodied in a well-known chapter in his *Manual*. He did not hesitate to devise yet another pattern, but, unlike scores of predecessors (Witkowsky made out nearly 400 different 'modifications') he did so after mature experience of those varieties which seemed to him the most fitted, not for the advertizing of the designer, but for the extraction of the fœtus living and unbruised. Simpson's and Barnes's forceps seemed to him the best. He blended in one long forceps the wide flange or finger-rest of the former with the finger-ring or loop in the shanks characterizing Barnes's instrument. We must bear in mind that neither the special devices just mentioned were "original" in the forceps which bear the names of the two undoubtedly distinguished men after whom they are named. The flange was present in some eighteenth century forceps, and in Hopkins' instrument (1828) the shanks were made with a wide ring for the forefinger. Thus Galabin was in no sense less

"original" than Simpson and Barnes. But a great development of the forceps coincided with the entry into the obstetrical world of Arthur Lewis Galabin. One desideratum seemed unattainable. The ordinary long curved forceps has the disadvantage that the direction of traction is apt not to be that in which the head is grasped, and in which it has to advance, but is inclined more anteriorly. All kinds of instruments were devised to overcome the disadvantage, but proved more or less unsatisfactory. At length, in 1877, Tarnier introduced his axis-traction forceps. Not only Aveling, like Van de Laar, T. Hermann and Morales, had endeavoured to design a forceps which would enable the operator to exert traction in the required line when the head is high in the pelvis. Galabin himself caused a forceps to be constructed for attaining the same aim without traction rods, after Tarnier's instrument had become known in England. Neither a biography of Galabin nor a systematic history of the obstetric forceps would be complete without a full reference to a memorable discussion, preserved in the nineteenth volume of the *Transactions of the Obstetrical Society of London*, where, in 1877, Wiltshire read a letter from Tarnier and exhibited that eminent authority's "new forceps," and Galabin showed and demonstrated the instrument of his own design just referred to. In that discussion we can find what was said and thought when the problem of axis traction seemed about to be solved. We all can judge for ourselves how far the experience of a generation of obstetricians has proved the value of Tarnier's contrivance. Galabin's views on the subject, as tempered by time, are to be found in successive editions of his standard text-book. It is most fortunate that a scientist so skilled in mechanics witnessed the introduction of the new contrivance and lived long enough to judge of its true value.

Perhaps Galabin showed his talents, experience and judgment at their very best in his famous paper "On the Choice of the Leg which should be seized in Version for Presentation of the Upper Extremity," preserved in the nineteenth volume of the *Transactions of the Obstetrical Society*, an admirable contribution, the substance of which was transferred to the author's *Manual* and is known to us all.

Much attention was bestowed by Galabin on that sad complication of childbed puerperal fever. His intelligent scrutiny of the copious statistics at his disposal in the Guy's Hospital maternity department, and his systematic Report on Puerperal Pyrexia, published in 1884 in the Collective Investigation Record of the British Medical Association were embodied in his Oration on the Etiology of Puerperal Fever, delivered in 1887 at the annual meeting of the Hunterian Society, and later on in his Inaugural Address as President of the Obstetrical Society in 1889.

Galabin took an active part in discussions at societies, more

especially the Obstetrical, and loved to exhibit specimens, which in his case we need hardly say were really worth showing and were lucidly demonstrated by the exhibitor.

Besides the preparation of manuals, monographs and papers, Galabin undertook literary work of another kind. In 1873 the first volume of the *Obstetrical Journal of Great Britain and Ireland* appeared, edited by Aveling, who resigned in 1876, and the editorship of the fourth, fifth, sixth, and seventh volumes was conducted by Galabin. He gave up the *Journal* one year before it ceased to appear.

Dr. Galabin, as we have seen, was a most active Fellow of the Obstetrical Society of London, which he joined in 1874, the very same year on which he took up midwifery. He held the usual minor appointments after election on the Council, and being a good man of business, undertook the office of Treasurer for three years. A year later, in 1889, Galabin was elected President of the Society for two years as usual. He was at the same time President of the Hunterian Society. Conscientiously active in both offices and busy at the time with private and hospital work, his health, which was never robust at any period of his life, broke down for a few months, but he recovered and was able to be present to deliver his valedictory address at both societies. Being a member of the British Medical Association, we need hardly add that, as in everything else with which he was concerned, he undertook active duties, figuring in 1887 as Vice-President of the Obstetric Section at the Dublin Meeting, and as President at the Nottingham Meeting in 1892.

Whilst he filled the chair simultaneously at two societies he was at another date Examiner in Midwifery at Oxford and London Universities, and in Midwifery and Gynæcology at Cambridge, all three together. He likewise was Examiner for the University of New Zealand, and was on the Conjoint Examining Board of the Colleges of Physicians and Surgeons.

Although never strong, it is clear that Galabin could not have been so weak as many believed him to be. He got through an enormous amount of headwork, administrative duties, practice and operative surgery, and kept records of his hospital and private patients. Sickly when a child, his first serious illness did not occur till 1886, when valvular disease declared itself, yet he undertook double presidential duties a few years later and rallied from the illness which then attacked him, although he twice underwent a serious operation. The cardiac symptoms ultimately subsided.

Notwithstanding his ceaseless attention to his duties Galabin found time for chess, being an original member of the Four Handed Chess Club, for Continental travel, especially amidst the mountains, and for horticulture. The latter resource greatly helped to neutralize the void which all professional men feel after retirement. He took

Tapley, a house which had been the property of his maternal grandfather, Mr. Woods, a member of an old family belonging to the Society of Friends, occupying it just fifty years after Woods had vacated it. He took the greatest delight in stocking his garden at Bishopsteignton with flowers, many of which he brought from the Dauphiné, Savoy, Swiss, and Italian Alps, and from the Riviera. His last days, associated with his love for botany and horticulture, were most pathetic. This winter he travelled as far as Sicily, where he was informed that the spring flowers were coming out very early in England. On receiving that information, he returned home to see his daffodils at Tapley. Unfortunately, after his desire was accomplished, he fell ill, dying of pneumonia at the end of five days, on March 25. The grave in which he was buried in Bishopsteignton on March 29 was lined with his beloved daffodils which—

"..... dry
Like to the summer's rain
Or as the pearls of morning due
Ne'er to be found again."

Fortunately Galabin's fame will be more lasting than the flower which he loved and which Herrick sang. We have endeavoured to indicate what a prominent part he took in the advance of scientific and mechanical obstetrics. Yet he was quiet and unostentatious in an age when men of ability seem to believe that it is necessary to assert themselves, or at least their views, rather loudly. He passed away honoured by his profession, esteemed by his grateful patients and pupils and beloved by his numerous friends.

ALBAN DORAN.

ARTHUR JOHN WALLACE, M.D. (Edin.).

To those of us who had the privilege of knowing and of working with Dr. Arthur Wallace, the news of his sudden and unexpected death, which took place on March 16 last, came as a great shock and has created a sense of deep personal loss among his many friends in the profession. It is difficult to realise that one who so recently was full of energy and work and in the prime of his life has passed away.

He was born at Dalston in 1866, and, having been educated at the Liverpool institute, began his medical studies at University College, Liverpool, and completed them at the University of Edinburgh, where he graduated M.B., C.M. in 1889, and took the degree of M.D. in 1896.

After holding junior appointments on the resident staff of the Royal Infirmary and the Holt Scholarship in Anatomy and Surgery at University College, Liverpool, his earlier years were passed in training for gynæcological work, partly in Paris and Berlin, but mostly under the guidance of his father, the late Professor John Wallace. In 1898 he was elected to the honorary assistant staff of the Hospital for Women, becoming full surgeon four years later. He had been full surgeon to the Maternity Hospital for fifteen years. Only a few weeks before his death he was appointed consulting gynæcologist to the Royal Southern Hospital, Liverpool.

During 1908 Dr. Wallace occupied the presidential chair of the North of England Obstetrical and Gynæcological Society, and closed his year of office by a very able presidential address on "Inflammatory diseases of the uterine adnexa." He also acted as secretary to the Section of Obstetrics and Gynæcology during the annual meeting of the British Medical Association held in Liverpool last summer.

Dr. Wallace was an admirable writer. His style was literary and cultivated, and his contributions to the literature of obstetrics and gynæcology were numerous, both on the practical and scientific sides. In many of these can be traced the influences of his earlier German teachers, whose trains of thought and lines of investigation caught his attention and for whose schools he always had a great admiration. An able German scholar, he devoted many of his holidays to visiting German cliniques, always bringing back some of their latest methods in the practice of his art. Dr. Wallace was one of the earliest in the North of England to adopt the abdominal route with pelvic dissection in the treatment of carcinoma of the cervix uteri. His recent contribution to this JOURNAL was a note on the practice of hebosteotomy.

He was an excellent operator: neat, quick, it might almost be said artistic, in his technique, which he practised with scrupulous

THE LATE ARTHUR JOHN WALLACE, M.D. (EDIN.).

aseptic thoroughness. His long dexterous fingers seemed capable of using a needle or applying a ligature in the most unusual positions. For some years he had adopted the Pfannenstiel incision which he used for all abdominal operations, and took much pride in the cosmetic aspects of the resultant scars.

Arthur Wallace was one of the most lovable of men. He had a quiet, placid and reserved but impressive manner, and spoke with a low-pitched and unimpassioned voice, expressing opinions with a strength and confidence which carried conviction. A keen lover of music, the influence of those days in Germany was marked by an almost passionate fondness for the music of Richard Wagner, with whose works he was thoroughly conversant. He was, indeed, no mean critic of modern music, and few things appeared to afford him greater pleasure than an interpretation to the uninitiated of the works of Wagner or Strauss.

An omnivorous reader, though mainly engrossed in professional literature, he took great delight in the study of Scandinavian literature and tradition.

His recreations mostly consisted in climbing, shooting and motoring. As a climber he was familiar with the most difficult ascents in the English Lake District, Snowdonia and Skye, and it is the testimony of several whom he introduced to the charms of this sport that with Wallace at the end of the rope they would climb with confidence the most difficult pinnacle. Motoring was probably his principal hobby; not only was he an excellent driver, but his knowledge of everything connected with the car classed him as an expert. There is no part of the British Isles that he did not explore in his car, and many motoring holidays were spent on the Continent.

In mourning his early death some poor consolation may be gathered from the fact that, although he met the discovery that he was suffering from malignant disease with almost incredible bravery and coolness, the knowledge of the ultimate probabilities concerning its results would have preyed upon and undermined his capacity for happiness in his work.

J. E. Gemmell.

ARTHUR JOHN WALLACE, M.D. (Edin.).

Nat. 1867—Obit. 1913.

Honorary Obstetrical Surgeon, Ladies' Charity and Lying-in Hospital; and Honorary Surgeon, Hospital for Women, Liverpool.

The PRESIDENT said:—It is with the deepest regret that I have to refer to the loss by death of our dear friend Arthur John Wallace. He was an original member of our Society, and his father, the late Professor Wallace, was our first President when the Society was founded in 1890. Arthur Wallace was Secretary in 1903–4; he served repeatedly on the Council and as Vice-President, and was President in 1908. When not actually in office, he constantly brought forward specimens and cases full of interest, while his papers and his contributions to our discussions were always marked by originality, independence of opinion and sound judgment.

The Treatment of Pregnancy complicated by Operable Carcinoma was the subject of one of his earlier works, which appeared in 1898. In 1902 he completed a classical paper on Repeated Cæsarean Section. The making and the closing of abdominal incisions was a subject on which he bestowed great attention. He wrote on it in 1903, and again quite recently; and no doubt it was owing to his careful technique in this matter that he was able to let his patients up without injury almost as soon as they liked after operation. He published his experiences of Early Rising after Laparotomy in 1911. Wallace was a pioneer in this country in the operative treatment of cancer of the cervix by the abdominal route. He operated on ten cases in 1903–1904, and described them to the Society in an important paper in 1905. In 1906 he gave us his experiences of Hebosteotomy, bringing them forward rather as a warning than otherwise. A year later he described a modification in the performance of Ventrofixation which divided the utero-vesical pouch into the lateral halves by the formation of a fan-shaped septum of peritoneum. This freed the operation from its chief fault, the risk of causing subsequent intestinal obstruction, and if any of us were still doing ventrofixations it would doubtless be Wallace's method that we should choose. In 1909 he introduced a discussion on the Preparation for and the after care of Gynæcological Cœliotomy cases, and in 1910 he described his method of doing Vaginal Subtotal Hysterectomy. This was really a very valuable contribution to our technique which has not as yet received half the recognition it deserves. For, as a method of dealing with uteri which bleed persistently at the menopause, removal of the bulk of the corpus uteri by the vaginal route is an operation of great utility. In 1910 Wallace also published a most

important paper on the Life History of Fibromyomata of the Uterus. This was based on clinical histories begun in his father's note-books and continued in his own, so that they covered periods up to nearly forty years. They showed that though many of his father's patients kept their fibroids, their lives were reduced to invalidism relieved only by episodes due to degenerative and necrotic changes in their tumours.

Wallace's enterprise as a surgeon was justified by his dexterity and by the care bestowed on his technique. His advanced attitude towards gynæcological questions was warranted by his experience and was not mere uncurbed enthusiasm. He was critical without acidity, entirely independent, and very modest about his own work. Knowing what he has done, and realizing what he would have done had he lived, we must regard his early death as a serious loss to British Gynæcology.

Since its foundation in 1890 our Society has lost members of high distinction and great personal charm, riper as to age and achievement than the one who has just gone: Wallace senior, Walter, Wright, Martin, Sinclair. Each of the four centres we frequent has been bereaved in its turn. In view of his youth and its promise, the death of Arthur J. Wallace is the saddest which we as a Society have as yet had to deplore.

W. E. Fothergill.

I have been invited by the Editor of this Journal to write a notice of the life, the professional work, and the character of the late Dr. Arthur John Wallace, of Liverpool.

He was an intimate and faithful friend of mine for many years. We have visited together France and Germany to see the gynæcological and obstetrical practice in these countries.

Dr. Wallace was recognized by all who knew him as a most capable and skilful gynæcologist and obstetrician. He also wrote many important papers on the subject. Dr. Wallace was, further, a man of high culture, and also an authority on Music and Art.

His premature death at the age of 46, will be deeply regretted by all his friends.

Arnold W. W. Lea.

REVIEWS OF CURRENT LITERATURE.

UNDER CHARGE OF EARDLEY HOLLAND, M.D.

LIST OF COLLABORATORS:

LONDON Alban Doran, F.R.C.S.; J. B. Banister, M.D.; J. Barris, M.B.; F. E. Taylor, M.D.; C. White, M.D.; J. A. Willett, M.D.; J. Wyatt, F.R.C.S.

EDINBURGH. Miss J. H. Filshill; R. W. Johnstone, M.D.; James Young, M.D.

DUBLIN. R. M. Allan, M.B., Ch.B.

GLASGOW. E. H. L. Oliphant, M.D.

ABERDEEN. W. R. Pirie, M.B.

MANCHESTER. J. S. Young, M.D.; J. Chisholm, M.D.

BIRMINGHAM. H. B. Whitehouse, M.S.; Lewis Graham, M.D.

LIVERPOOL. H. Leith Murray, M.D.

SHEFFIELD. W. W. King, M.B.

DUNDEE. J. A. C. Kynoch, M.B.

CHELTENHAM. C. J. N. Longridge, M.D.

GYNÆCOLOGY.

Cystic Dilatation of the Appendix.

DUROUX (*Revue de Gyn. et de Chirug. Abdom.*, Feb. 1913) has collected eleven cases in which the vermiform appendix was found distended by fluid. In some cases the distension was considerable so that the organ looked like a banana. He has carefully divided the cases into sub-divisions according to whether the dilatation was general or at the distal or proximal end of the appendix. The cases are clinically those of chronic appendicitis—acute attacks are apparently rare. An attempt is made to connect this type of appendicitis with tubercle but the evidence is not quite conclusive as the diagnosis rests on the presence of giant cells, in one case the occurrence of a chronic skin ulcer where the appendicular fluid infected the incision and the presence of "tuberculous granulations" on the peritoneum of a guinea-pig that died on the fifth day after inoculation with fluid from the distended appendix in another case.

These cases have occurred chiefly in young adults and two of the eleven cases have been in children.

Owing to the danger of infecting the peritoneum with the toxic contents if the thin-walled sac is burst during removal, it is advised that a free abdominal incision should be used.

The article is well illustrated and references to the literature are given.

C.W.

Action of Lutein Extract on Blood.

KIUTSI (*Monats, f. Geb. u. Gyn.*, Bd. 36, Hft. 5, 1912) has found that extracts of human corpus luteum prepared by grinding up the fresh material with sand in normal saline, produce rapid clotting of human blood. He suggests that this action may be the cause of the arrest of the menstrual flow and perhaps also of the bleeding from a ruptured follicle.

H.L.M.

Carcinoma of the Vulva

RUPPRECHT (*Zeitschr. f. Geb. u. Gyn.*, Bd. lxxii, Hft. 3) has investigated the records of twenty-five cases of this disease. He finds it to be of a low order of malignancy, rarely causing metastases, and frequently running a slow course. The essentially incomplete operation of resection, which is usually practised, is followed by recovery lasting many years in a large number of cases. The author makes several suggestions for the improvement of the technique of the operation, which should be followed by still better results. R.W.J.

The Treatment of Fibroids by X Rays.

SIREDEY (*Revue de Gyn. et de Chirug. Abdom.*, Feb. 1913). The writer starts with a short review of the literature on this subject and points out that when it was first tried in Germany it was received with great enthusiasm, but that subsequent reports, although favourable, are less enthusiastic.

The drawbacks to this method of treatment are the occasional appearance of severe ulcerative dermatitis and the possibility that a carcinoma may also be present in the interior of the uterus, and thus valuable time may be lost.

Siredey gives the results of 59 cases treated by Röntgen rays. These 59 were made up of 40 fibroids and 19 cases of metrorrhagia without fibroids. Sixteen of the latter were cured, one had an operation performed, one relapsed and one is still under treatment. Of the 40 fibroid cases, two had operative treatment, two are still undergoing treatment and one got worse. The tumours as a rule get smaller but the diminution in the symptoms is as a rule more marked than the actual atrophy of the tumour.

The rays act chiefly through the ovaries. Sections of ovaries removed after Röntgen ray treatment show destruction of the Graafian follicle, while sections of the uterus show little change.

Siredey quotes two cases at length. One patient had exophthalmic goitre and the other aortic disease. In both cases the general condition contra-indicated operation and in both cases the application of the rays was followed by improvement.

It appears that the treatment must be prolonged and that to start with the symptoms may be increased instead of lessened. The results in cases of fibrosis of the uterus are better than where definite tumours are present.

Cases unsuitable for treatment are large tumours, sub-mucous tumours, degenerated tumours, fat patients, cases with co-existing ovarian or tubal disease and young patients.

The best results are got with small sub-peritoneal undegenerated fibroids in a patient near the climacteric. C.W.

The Influence of Myomata on the Blood Supply of the Uterus, with special reference to Abnormal Uterine Bleeding.

JOHN SAMPSON (*Surgery, Gynæcology and Obstetrics*, Feb. 1913) contributes a long article dealing with the clinico-pathological study of 150 injected uteri containing myomata. It is impossible to do justice to the paper without reference to the numerous illustrations, most of which are *x*-ray photographs of specimens injected with a bismuth emulsion.

Menstruation is preceded by changes in the venous plexus of the endometrium which permit the escape of blood into the tissues: thus the bleeding is of venous and not arterial origin. The most important factor in controlling the venous circulation is the muscular efficiency of the uterus.

Small sub-serous myomata are relatively anæmic, and, while larger tumours of the same type have a considerable arterial supply, the vascular changes are almost limited to the peripheral zone of the uterus with the result that menstruation is but little affected. Small intramural myomata are unimportant, but tumours of over 2·5 cm. in diameter have a large arterial supply and the venous plexus of the myometrium is always dilated. In these cases if the uterine muscle is inefficient menorrhagia results.

Bleeding in sub-mucous myomata takes place from the parts of the endometrium not encroached upon by the tumour. The mucous membrane over the myoma is atrophied from anæmia due to pressure.

When bleeding arises from the tumour itself as from sloughing or sarcomatous changes, it is arterial and not venous. W.W.K.

The Cure of Procidentia in Elderly Women.

Fred Fletcher (*Surgery, Gynæcology and Obstetrics*, Feb. 1913) states that he has obtained good results in procidentia from the following operation :—

After amputation of the cervix, anterior and posterior colporrhaphy and perinæorrhaphy, he opens the abdomen and performs a supra-vaginal hysterectomy. After ligature of the cardinal vessels the stumps of the broad ligaments are brought through the muscle and fascia of the anterior abdominal wall and there sutured as in a Gilliam's operation. The cervix, whose mucous membrane has been removed at the time of the amputation, is sutured to the peritoneum just above the pubic bone. The abdomen is then closed in the ordinary way. W.W.K.

Cystoscopic Examination as a means of diagnosis of operability in Carcinoma Cervicis Uteri.

P. Cruet (*Annales de Gynæc. et d'Obstet.*, January and February 1913). The author contributes a long and interesting article illustrated with several coloured plates. His views may be summarised as follows :—

1. Involvement of the bladder and ureters by a neoplasm is a contra-indication to operation.

2. Vaginal and rectal palpation are often not able to demonstrate the condition of the bladder and ureters.

3. Urinary disorders are of no value in the diagnosis. The symptoms often appear late, or the growth may be advanced without giving rise to urinary symptoms.

4. Cystoscopic examination only can demonstrate the condition of the bladder wall, and whether the ureters are compressed.

5. Cystoscopic examination reveals the following modifications : bulging of the bladder wall; bulging of the bladder wall complicated by vascular disorders such as abnormal vascularisation or hæmorrhagic exudations; deviation of the trigone and the formation of vesical diverticula; the formation of folds in the situation of the base of the bladder; the presence of carcinomatous nodules, and ulceration.

6. These pathological modifications of the bladder wall, except those which are obviously of the nature of new growth are not specific of new growth, but occur also in certain diseases of the uterus and adnexa and even in certain forms of cystitis.

7. This obscurity has only a relative importance. Seeing the difficulty of differentiation before and even during operation between inflammatory adhesions and those due to growth one must consider rather the extent

than the nature, for it is in this that the danger to the bladder and ureters lies.

8. Statistics in general and Cruet's own cases show that simple bulging of the bladder wall, whether complicated by vascular changes, is of no value in diagnosis; the formation of folds is usually inflammatory in origin; the presence of diffuse œdema with extreme adhesions render operation dangerous or useless.

9. Compression of the ureters is shown by the retardation, and irregularity of the stream of urine, and the force of ejaculation. Such signs nearly always indicate the presence of serious operative difficulties.

One could, therefore, when in doubt as to the advisability of operating have recourse to the cystoscope, which will often prevent a needless operation. J.B.

The Conservative Treatment of Salpingitis

I. S. Stone (*Journ. Amer. Med. Assoc.*, vol .60, p. 656). The result of several year's experience has convinced the author that many tubes can be rendered sterile by consecutive treatment. The method adopted is as follows: the cervix is held and a two-ounce glass syringe with a conical point, which will reach through the internal os, is half-filled with a diluted tincture of iodine (. ıe part to three of spirit). This is pressed into the uterus and held there for at least two minutes. The patient is now placed in the high pelvis position and the abdomen opened. The tube is separated, brought into the wound, and carefully irrigated with the same fluid. If the resection of the extremity of the tube is necessary, a phimosis operation may be done. The author considers that the application of iodine by this method to the uterus and tubes is much more efficacious than the ordinary practice of packing with gauze saturated in an antiseptic, and does not lead to any pain or discomfort. Experiments have shown that it is easier to force fluid into the tubes from the uterus when the latter is inflamed than when the mucous membrane is not infected. C.N.L.

The difficulty of producing sterility by operations on the Fallopian Tubes.

V. N. Leonard (*Amer. Journ. Obstet.*, March 1913). In this paper the various methods of sterilizing patients are enumerated and the experience of authorities cited in regard to the occurrence of pregnancy after their use. After simple ligation pregnancy has been quite common and the author quotes the after-history of fourteen patients. Five were over 40 at the time of operation, but two of the remaining nine became pregnant.

Section of the tubes and resection between ligatures also failed in several instances, and even when the uterine end is buried in the broad ligament pregnancy has subsequently occurred, while a later cœliotomy has shown the previously buried end communicating freely with the abdominal cavity.

The cautery has been used in animals but complete atresia was not produced.

Many pregnancies also have been reported after the removal of both tubes, a case of this kind having occurred in the author's own hospital.

Dr. Leonard quotes the extraordinarily contradictory results obtained by Fränkel and Rousse in experiments on rabbits, and concludes by recommending bilateral salpingectomy with excision of a wedge of uterine cornu as the only simple procedure offering reasonable assurance of preventing subsequent conception. J.B.B.

Bilateral Fibromatosis of the Ovaries.

ARCHIE ROBERTSON (*Journ. Amer. Med. Assoc.*, vol. 59, p. 1597). The patient was a strong and active single woman of 18 years. She first menstruated at the age of 14. Since that time the periods were more or less irregular and ceased entirely at the age of 17. No pain, discomfort or illness had been present at any time, but the patient had lost 15 lbs. in weight during the year previous to examination, which revealed the presence of a firm, lobulated, slightly movable mass on the right side of the lower part of the abdomen. This tumour was removed and weighed $2\frac{1}{4}$ kilos. It was sawn in two and consisted of a solid body wall with an oval cavity in the centre. The left ovary was also removed. On pathological examination the left ovary was found to consist of simple fibromatous tissue. The right ovary consisted of fibromatous nodules, and a bony mass which had the appearance of eburnated bone. The central cavity contained degenerated connective tissue with some lime salts. There was no evidence of teratoma. Chemically the analysis of the bony mass was found to correspond with that of normal bone. C.N.L.

Neuro-epithelioma of the Ovary.

GOSSET and MASSON (*Revue de Gyn. et de Chirug. Abdom.*, Jan. 1913). The tumour to which the above name is given was removed from a woman aged 50. The tumour was as large as the fist and was removed without difficulty, eight months later the patient returned with malignant peritonitis and died. No post-mortem could be obtained. The tumour was hardened and cut with great care; these sections are described with the most minute detail. The article is illustrated by ten micro-photographs, four being reproduced in natural colours.

The tumour was degenerate and partly cystic, one part was more solid than the rest, and it is on the examination of this portion that the diagnosis rests. It was made up of masses of cells containing gland spaces lined by several layers of cells—in places small cysts are present.

The authors exclude the diagnosis of sarcoma and give reasons for thinking the growth to be an epithelioma. They state that the rosettes of epithelial cells are absolutely identical with those found in the nervous system of an early embryo. The tissues do not stain as ordinary connective tissue or elastic fibres do; unfortunately the method of hardening that was employed prevented the special selective stains for nervous tissue being employed. The cysts that are scattered through the tumour have a lining of cells which is like the ependyma of the brain.

Having discussed the matter very fully the authors conclude that the tumour is a neuro-epithelioma, they then go into the question of its origin.

Tumours made of nervous tissue can be divided into two kinds—those derived from the central nervous system and those taking origin in the sympathetic. The two have this in common, they both contain cells that give rise to processes having the characteristics of nerve-fibres and the cells themselves may be multipolar and contain Nissl's granules in well developed tumours. But they differ in that the rosettes of cells, in tumours derived from the sympathetic are arranged round a solid centre formed of fibres which get out by passing between the cells. In the case of central nervous system tumours, however, the cell masses are hollow and the cells which line the cavity are characteristic. The writers think their specimen belongs to the latter group, but as a large number of the cells are embryonic and not fully differentiated they propose to call it an "embryonic neuro-epithelioma." C.W.

Involvement of the Ovary in Epidemic Parotitis.

HARLOW BROOKS (*Journ. Amer. Med. Assoc.*, vol. 60, p. 359). The first patient was a healthy multipara, aged 28 years old. The parotitis was confined to the left side. Seven days after the swelling of the salivary gland had subsided, the ovary on the same side became enlarged, very painful and tender, so much so that a diagnosis of salpingitis was entertained. The severe pain subsided after two days and was followed by menstruation, ten days before its normal time and rather more profuse than usual. After this the ovary was found considerably reduced in size and tenderness, though still painful and enlarged. The patient did not become pregnant during the subsequent five years that she was under observation.

The second case was that of a married nullipara, aged 24, who developed bilateral parotitis of moderate degree. Five days later she developed acute pain on both sides of the pelvis. Examination showed both ovaries to be enlarged to the size of a hen's egg, and exquisitely tender. The temperature and pulse were increased. Two days later both breasts also became swollen, tender, and red. The swelling of both the breasts and ovaries rapidly subsided without any special treatment. She has remained under observation for over six years. The periods have been perfectly normal, there has been no sign of ovarian disease, but she has not become pregnant.

The rarity of ovarian complications in mumps may be due to the protected position of the ovary within the abdomen. The recorded cases have mostly developed in children, or young girls, and the trouble usually is followed by a favourable result. C.N.L.

Ectopic Pregnancy and Intraperitoneal Hæmorrhage from Ovarian Cysts, especially those of the Corpus Luteum.

H. REINHARD (*Gynæckol. Rundschau*, 1913, Hft. 6) discusses the various views held and gives the histories of two cases of rupture of blood-cysts of the corpus luteum, and of a case of rupture of a luteal cyst of pregnancy complicated by a tubal pregnancy. He summarises his opinions: (1) Extra-uterine pregnancy is the most frequent but not the only cause of hæmatocele or of free intra-peritoneal hæmorrhage. Next to it comes rupture of ovarian cysts, (2) blood-cysts of the corpora lutea are of special importance; they occur more frequently than serous cysts but do not reach the same size and consequently very seldom rupture. (3) The rupture of luteal cysts occurs usually a few days before the expected onset of menstruation. The most frequent cause is some accidental trauma (running, dancing, gymnastics, severe work). (4) The occurrence of several corpora lutea in an ovary is not unusual; cystic degeneration is not uncommon. It occurs more frequently in association with hydatid mole and chorion epithelioma, though there is no specific connection between them. (5) Tubal pregnancy is frequently associated with luteal cysts. Rupture of these cysts during pregnancy has not hitherto been recorded.

An extensive bibliography is given. R.M.A.

OBSTETRICS.

A Case of Simultaneous Intra- and Extra-uterine Gestation.

VAUTRIN (*Bulletin de la Société d'Obstétrique et de Gynécologie de Paris, etc.*, No. 2, Feb. 1913) describes a case of simultaneous intra- and extra-uterine gestation occurring in a iii-para, aged 36. In July 1912 the last menstrual period occurred and between September 5th and 21st acute

abdominal crises set in, attributed by the patient to hepatic colic. On October 15th pain became more acute and upon October 20th abortion of a four months' fœtus occurred. At this period fever and diarrhœa were present and typhoid fever was suspected. These symptoms subsided and constipation developed coincidently with the appearance of a tumour in the left iliac fossa. This tumour, which clinically resembled a fibromyoma, continued to increase in size and on November 21st a fresh acute attack of pain and vomiting supervened. The general condition of the patient appeared to be deteriorating and upon December 14th, 1912, Vautrin performed laparotomy. A gestation sac containing a healthy fœtus of about five months' development was found in relation with the abdominal extremity of the left tube. Abortion had apparently taken place and the sac was in part formed by tube and in part by omentum, small intestine and pelvic colon. The left appendages and fœtal sac were excised, and the patient made an uninterrupted recovery.

In his discussion of the case, Vautrin remarks upon the interesting fact that the uterine abortion occurred before it was necessary to interfere in the case of the ectopic gestation. The pressure effects of the latter undoubtedly gave rise to the intestinal symptoms and were one of the factors which led to the final indication for operation. H.B.W.

Gigantic Children.

AHLFELD (*Zeitschr. f. Geb. u. Gyn.*, Bd. lxxii, Hft. 3) has surveyed more than eighty recorded cases where the child at birth was gigantic in its proportions. Crantz and Lehmacher of Vienna top the list with a record of a dead infant delivered by Cæsarean section in the year 1755 which weighed 23 pounds! Schwabe recorded a case in 1910 where the infant, born dead, weighed 20 pounds and measured 23 inches long. Ahlfeld discusses the causes of the enormous development, and finds that such cases are often associated with (1) pluriparity or multiparity in the mother; (2) large size of the parents; (3) prolongation of the gestation period; (4) male sex of the child. He puts in a plea for earlier recognition of the condition and recourse to Cæsarean section. R.W.J.

Pulsations observed in Aborted Embryo of Second Week.

ARMANN (*Amer. Journ. Obstet.*, Feb. 1913), attended a patient for abortion at the sixth week. Before his arrival at her home, a number of clots had been passed and were collected in a vessel. Armann found the cervix partly dilated and the nature of the case was self-evident. The periods had been absent for six weeks. Amidst the clots lay an intact ovum, light grey, of the size of a hazel-nut, and covered with normal villi. On opening the membranes, Armann saw that the primitive heart was pulsating actively. The pulsations amounted to 90 per minute and continued for about fifteen minutes, quite regular. They then became less distinct and slower for five minutes longer, and at the end of that time ceased completely. The cardiac tube was as large as the head of a pin, with no differentiation into chambers. The embryo measured 2·5 millimeters and its yolk sac was distended and as large as a lentil. It corresponded in size to an embryo of about fourteen days' development. Armann claims that this is the first instance where pulsations have been observed in so young an embryo. The youngest hitherto reported was Pflüger's case, but it had reached the fourth week, at which stage the auricles and ventricles are beginning to develop. Pflüger, whom Armann quotes, placed the ovum between two watch-glasses in a

warm room and was still able to demonstrate the cardiac pulsations on the following morning. The heart contracted at intervals of from thirty to forty seconds, and the pulsations, gradually decreasing in frequency, lasted for over an hour. In older embryos the heart has often been observed pulsating actively for some time after birth. Armann adds a useful hint to others who in future may come across very early embryos at or soon after their expulsion. Whilst cold slackens the pulsations, warm saline solution accelerates them. Bischoff studied pulsations in the primitive heart of rabbits and guinea-pigs. A.D.

The Meiostagmin Reaction in Pregnancy.

JULCHIERO (*Wien. klin. Woch.*, 1912, No. 43, p. 1699) adopting the method of Ascoli and Izar, has observed the parallelism that exists between pregnancy and malignant disease. He prepared three antigens by extracting with methyl alcohol (1) dog's pancreas, (2) malignant tumours, and (3) human placenta. In general, he found that in pregnancy from the sixth month onwards, there is a much greater reaction than in the non-pregnant state or in men without malignant disease. The majority of cases proved positive during pregnancy but none of the cases showed the very marked variation which is exhibited in malignant disease. (Details of the Meiostagmin reaction may be obtained in the *Journal of the Amer. Med. Assoc.*, May 28, 1910, p. 1790.) H.L.M.

Toxicity of the Urine in Pregnancy.

ESCH (*Arch. f. Gyn.*, Bd. 98, 1912) has experimented with the urine in pregnancy, injecting it intra-cardially into guinea-pigs and observing alterations of temperature, minimal anaphylactic doses and the degrees of anaphylactic shock. He found the toxicity scarcely increased in normal pregnancy, always lowered during labour and occasionally somewhat raised during the puerperium. On the other hand, the urine from two cases of eclampsia was extraordinarily toxic and this was not dependent on the acidity, the specific gravity or the albumen content. By combining serum sensitisation with urine intoxication and vice versa, he was able to show that this toxicity of the urine was not due to an antigen in the blood.

H.L.M.

Chorionic Villi in the Uterine Wall eighteen years after the last Pregnancy.

EMIL REIS (*Amer. Journ. Obstet.*, March 1913). This is the account of a case which the author considers to throw much light upon the pathogenesis of chorion-epithelioma. The literature contains cases in which the tumour appears many years after the last pregnancy and the question arises: did they start from surviving chorio-epithelial elements in the uterus or do they all belong to the same type as Pick's case of the child with the chorio-epithelioma in its ovary where there was no possibility of pregnancy?

Dr. Reis' patient was 45, had had her last pregnancy 18 years before, and had been suffering from increasing menstrual loss for eight months. The uterus contained fibroids and was removed. A small grape-like mass was found in a vein at the left cornu and the other veins in this situation contained similar matter.

Sections show "formations of the size, shape and appearance of chorionic villi which have undergone fibroid and hyaline degeneration. They invade the muscularis and in places lie between the muscle and connective tissue bundles of the uterine wall. No syncytium and no Langhaus' cells can be seen in any section."

Dr. Reis draws attention to the known fact that the presence of fibroids favours the invasion of the uterine wall by chorionic epithelium, points out that these remnants may in his case have been in situ even longer than eighteen years, and considers that the absence of chorionic epithelium explains why his patient did not develop a chorion epithelioma.

J.B.B.

Do the Parathyroids Functionate in Intra-uterine Life.

Axel Werlius (*Surgery, Gynæcology and Obstetrics,* Feb. 1913) has removed the thyroids and parathyroids from eight pregnant dogs. In all cases death took place earlier (average two days) than when the same operation was performed on non-pregnant dogs (average five to ten days). Convulsions come on sooner in pregnant than in non-pregnant animals, and the earlier thyroparathyroidectomy is performed in pregnancy the longer is the post-operative life. Hence he argues that the fœtal parathyroids do not functionate in intra-uterine life.

In the earlier onset of convulsions and more rapid death following thyro-parathyroidectomy in pregnant animals the writer sees some confirmation of the parathyroid theory of eclampsia. W.W.K.

Blood-clotting in Eclampsia.

Engelmann and Ebler (*Monats. f. Geb. u. Gyn.,* Bd. 36, 1912, No. 2) have examined the coagulation time of the blood in eclampsia by the method of Bürkers. They find that it is not appreciably shortened and in this find a strong argument against the anaphylactic theory of eclampsia.

H.L.M.

Eclampsia an Immunity Reaction.

Bauereisen (*Zeitschr. f. Geb. u. Gyn.,* 1912, Bd. 71) has conducted researches on guinea-pigs and rabbits which convince him that eclampsia bears some relation to an immunity reaction developed in pregnancy. He found that homologous placenta and homologous testicle were capable of giving rise to anaphylaxis—that is to say they act on the homologous animal as antigens. He was unable to produce any such effect with fœtal serum.

He considers that the disturbances of the organism during pregnancy are related to the development of an immunity process, and that the phenomena of eclampsia must be viewed from two standpoints: (1) the toxic albumins in the placenta and (2) the immunity developed. H.L.M.

"Syncytioprecipitin."

Kiutsi (*Zeitschr. f. Geb. u. Gyn.,* Bd. lxxii, Hft. 3) contributes a long and elaborate study of recent aspects of Veit's theory of eclampsia, based upon his researches at the latter's clinic at Halle. He regards eclampsia as a sudden intense intoxication by the nuclear substance of syncytium. The other conclusions of the paper are associated with the immunological aspects of the question. R.W.J.

REPORTS OF SOCIETIES.

ROYAL SOCIETY OF MEDICINE.

Section of Gynæcology and Obstetrics.

Meeting held Thursday, March 6, 1913.

The President, Dr. Amand Routh, in the Chair.

A discussion on the subject of

Ventrifixation of the Uterus

was introduced by the reading of three papers as follows :—

I.—Indications for the Operation.

By W. S. A. Griffith, M.D., F.R.C.P. (Lond.), Physician Accouch., St. Bartholomew's Hospital.

The operation of suspension of the uterus is adapted for the relief of certain cases of displacement of the uterus where there is a failure on the part of the supports of the uterus to maintain that position which is necessary for the comfort of the patient, and to enable her to perform ordinary laborious duties. The class of cases needing the operation may be divided into two :—

(1) Those in which the supports of the uterus are sufficient to maintain it at, or nearly at, its proper level in the pelvis, but in which retroversion or retroflexion of the body of the uterus and adjacent broad ligaments, leading to prolapse of the ovaries, is the cause of the serious discomfort.

(2) The cases in which prolapse of the uterus, broad ligaments, and ovaries is considerable, and is associated with varying degrees and forms of vaginal, vesical and rectal protrusion.

In both of these groups many cases are sufficiently relieved by pessaries, though some women, for various reasons, prefer the relief to be obtained by operation to the prolonged use of pessaries and the medical attendance and frequent douchings which are the necessary alternative.

The following appear to be clear indications for the operation :—

Class 1.—The uterus is retroverted and more or less fixed by adhesions.

The uterus is pressed down in the position of retroversion by a tumour, commonly ovarian.

After enucleation of a fibroid from a retroverted uterus.

The retroversion is complicated by prolapse and enlargement of the ovaries, a constant source of pain, unrelieved, and in some cases increased, by the pressure of the pessary.

The retroversion or retroflexion is not kept in position by a pessary, owing to the small size of the vaginal cervix or the dilated condition of the vagina.

Class 2.—In this class the operation is often needed, the prolapse of the uterus being accompanied by prolapse of the vagina, and in most cases great enlargement of the vaginal orifice. The large rings so frequently used do much harm by the greater dilatation of the vagina which they cause.

The support which the operation gives to the uterus in this class is only a part of that needed for their complete relief, and I am accustomed to perform it at the end of the vaginal operation—namely, after curetting, partial excision, or repair of the cervix, if these are needed, and after the repair of the posterior vaginal wall and perineum, with anterior colporrhapy if the cystocele is considerable.

An examination of the patients, twelve months or longer after operation, is essential for a correct opinion as to the result.

Some surgeons are in the habit of performing this operation in cases of retroversion in women of poor general health (who have no local symptoms) with the idea that retroversion is a cause of the general feeble state of health. Most of us are probably of the opinion, with which I agree, that the condition of the uterus in these cases is merely a symptom, and in no sense a cause of the ill-health, and that it is undesirable to subject such patients to this operation.

II.—The Technique of Ventral Fixation and Allied Operations.

By H. Briggs, M.B., C.M., F.R.C.S., Prof. of Obst. and Gyn., Liverpool University.

This portion of the discussion will be opened by the advocacy of a purely peritoneal direct ventral fixation over a limited and appropriately chosen area—*i.e.*, over a site immediately adjacent to the pelvic floor.

As a low-level fixation by silk suture of the lower portion of the body of the uterus to the parietal peritoneum adjacent to the summit of the bladder, its peritoneal bands are harmlessly and effectively situate above the usual cervical site of the retroflexion.

This operation, as an early emanation from the operative treatment of a series of 600 cases, will be described and defended from personal experience.

Its simplicity and efficacy, as a method of ventral fixation, further ensure complete freedom to the greater part of the body of the uterus during the child-bearing period of life when the operation is at its best.

Other methods of direct ventral fixation with fascial and muscular attachments and the round ligament operations of Gilliam and others will be included in a general reference to the stress and strain of an inadequate pelvic floor.

The strength of the pelvic floor and its varying prospects will be considered in relation to the treatment of prolapse of the uterus: early complete restoration by operation will be advised.

A further statement of the commoner complications and of the possibly defective attempts at accurate inclusive conservative treatment, in cases of backward displacement with symptoms justifying an abdominal section, leaves a relatively small number of cases in which ventrofixation alone can be adequate treatment.

III.—The After-results of Operations for Uterine Displacements.

By Arthur E. Giles, M.D., F.R.C.S., Surgeon to the Chelsea Hospital for Women, Gynæcologist to the Prince of Wales' Hospital.

Vaginal fixation operations are not considered abdominal operations, for the fixation or suspension of the uterus are so varied that it is necessary, when discussing after-results, to specify the particular procedure adopted.

The present remarks have reference neither to "ventro-fixation" nor "ventro-suspension" of the uterus, but to the specific operation to which the speaker restricts the term "hysteropexy": the features of this operation are described.

In his previous recorded after-results of abdominal operations down to July, 1909, there were 309 cases of hysteropexy, 248 of which were traced. From August, 1909, to July, 1912, 199 additional cases were done, making a total of 508 hysteropexy operations.

An endeavour has been made to complete the after-histories of the additional cases : about 120 of them have been traced.

An analysis of these cases confirms the conclusions previously arrived at—namely, that the general health is improved and symptoms relieved in over 90 per cent.; that the position of the uterus remains permanently good in over 95 per cent.; that hysteropexy when followed by pregnancy causes no subsequent complications of labour; and that pregnancy following hysteropexy does not disturb the position of the uterus.

Of the 199 additional cases, 92 were operated upon for retroversion, 40 for prolapse, and 67 for procidentia. To get the best results in the last two groups, it is usually necessary to combine plastic operations on the vagina and perineum with the hysteropexy.

It is desirable that operators should record the results of a large number of cases of other operations for uterine displacements.

Discussion.

Following the reading of the papers there was a general discussion, in which a large number of speakers took part :—

Dr. Herbert Spencer was surprised at the frequency with which other gynæcologists performed this operation, as he himself had only done it 27 times in 1000 abdominal sections. The reason why he had performed so few of these operations was that it was an unscientific operation by no means free from danger; Giles had had 4 deaths in 220 cases, Zweifel 5 deaths in 336 cases, four of the latter being deaths from septic peritonitis. Another reason which influenced him was that he had seen so many cases in which the operation had failed to relieve the symptoms. He noticed in Dr. Giles's valuable investigation into the after-history of these cases that 42·2 per cent. of those inquired into had pain after the operation, although in 32·5 per cent. it was stated that the pain was less than before. In his opinion, both ventro-suspension and ventri-fixation, as ordinarily performed, were unscientific and dangerous operations, giving rise to peritoneal bands which on many occasions had caused strangulation of intestine. For procidentia in women beyond the menopause he considered ventri-fixation a useful adjunct to colporrhaphy and perneorrhaphy, but care should be taken completely to close the peritoneum over the bladder.

Dr. Archibald Donald said he would confine his remarks to cases of mobile retroversion. Dr. Griffith had said that the operation should not be performed for retroversion when there were no local symptoms, but he did not state what he considered the symptoms of retroversion to be. The speaker believed that the symptoms usually associated with retroversion were menorrhagia, metrorrhagia, and dysmenorrhœa, and many operations for retroversion were done in the hope of curing these symptoms, which were attributed to congestion induced by the displacement. There was, however, no reliable evidence that retroversion caused congestion, or that congestion could lead to changes in the endometrium causing menorrhagia, metrorrhagia and leucorrhœa. The practice of stitching up the uterus for the cure of these symptoms was therefore unscientific. The speaker believed that in these cases there was an abnormal condition of the endometrium (endometritis), which was often the cause but never the result of the retroversion, and his own practice was to curette these cases and disregard the position of the uterus.

Dr. MACNAUGHTON-JONES said he had never performed hysteropexy as advocated by Dr. Giles. Since 1905 the operation he had performed was as follows: A strong catgut suture, to last eighteen days, was passed on each side to as to include a loop of the round ligament, the parietal peritoneum and the peritoneal fascia. The ligaments were then crossed so as to bring the ligature out at the opposite side; the ligatures were tied after closing the peritoneum. He did not think that *fixation* of the uterus should be practised during the child-bearing period of life.

Miss IVENS said that her operation experience was confined to 150 cases of Gilliam's operation. In the last 50 cases she had adopted Mayo's modification, the round ligament being drawn through the peritoneum at the internal inguinal ring so that no abnormal slit was left as in Gilliam's procedure. There had been one fatality in a case complicated by chronic appendicitis. About 93 per cent. of the cases had been followed up and the results were very satisfactory.

Dr. HANDFIELD JONES did not consider that cases in which the ovaries and tubes were removed for disease, the uterus then stitched forwards, should be regarded as cases of ventri-fixation, as in the vast majority there was no need to suture the arteries at all. He had found the operation of most use in women of middle age who found relief from wearing a pessary, but after a reasonable time were unable to do without this support. He had seen much distress caused by the uterus being fixed at too high a level, and in these cases he had given the patients immediate relief by setting the organ free again. The patient should be prepared for the operation by ten days' treatment in bed with hot douches and glycerine tampons.

Dr. ARNOLD LEA said he had done the operation 75 times in abdominal sections; the greater number of the cases were for backward displacement. He was opposed to treating those cases with pessaries as the pessaries rarely had any curative effect, except in cases of simple retroflexion following confinement.

Dr. HUBERT ROBERTS believed that the greater number of cases of backward displacement did not require operative treatment at all. He considered that retroversion was after the first stage of prolapse, and if an operation was required at all it should be directed to repairing the pelvic floor. He had done the operation in a few cases, selecting Gilliam's operation in young women and ventri-fixation in women who had passed the child-bearing period.

Mr. BECKWITH WHITEHOUSE expressed the opinion that in some centres there was a growing tendency to fix the uterus for inadequate causes. In his experience fixation often failed to relieve pain in the case of patients suffering from simple displacements, and care should be exercised in the choice of cases. He had seen a case of intestinal obstruction which was caused by a band of adhesions resulting from fixation of the uterus to the abdominal wall, and he did not regard this method with favour. His own preference was for the "sling" operation of Clarence Webster, in which a loop of the round ligament was drawn through the broad ligament on each side and stitched to the posterior uterine wall. He described in detail the technique he had himself been led to adopt.

Dr. J. S. FAIRBAIRN wished to speak only as to the indications for the operations. With regard to cases of simple backward displacement he agreed with a previous speaker that the operation should only be done when absolutely necessary. The difficulty was to decide what made it necessary, and he considered that those who did these operations by the hundred were

still living in the mid-Victorian period of gynæcology when displacements were regarded as of supreme importance.

Dr. FARQUHAR MURRAY reported some clinical observations made by Mr. Bryden Glendining and himself upon the capacity of the bladder before and after ventri-fixation. In the result half the cases showed an increased capacity, half a decreased capacity after the operation.

Dr. WALTER TATE said that he had performed the operation of ventri-fixation in 44 cases between the years 1900 and 1910 at St. Thomas's Hospital. In 25 of these the after-history had been followed up showing that seven had borne one or more children since the operation without any complication occurring during either pregnancy or labour. This good result he attributed to the fact that the fixing sutures were passed through the lower part of the uterus leaving the fundus free. In contra-distinction to a previous speaker, he considered that the operation was specially called for in women in the prime of life who had to earn their living. But he only advised the operation in cases when pessaries and other methods of treatment had failed to relieve. He had also found the operation of use in some distressing cases of incontinence of urine from weakness of the bladder sphincter. By fixing the uterus the neck of the bladder was also supported, and in this way the relief of the trouble might be explained.

The PRESIDENT (Dr. Amand Routh) hoped that the speakers in their replies would more closely define the indications for those cases where ventri-fixation was done for retroversion where the uterus was mobile. Accessory ventri-fixation was in many cases a recognised and useful addition to a laparotomy performed for removal of appendages, etc., but he doubted if it was often a necessity apart from those cases.

His primary ventri-fixations did not amount to more than 3 per cent. of the abdominal sections, and they were almost entirely cases where in addition to the retroversion one or both ovaries were also prolapsed. Here ventri-fixation had its most useful application.

Plastic operations, curettage, etc., had each their special indication in these cases of retroversion, and these minor operations often relieved the patient better than a ventri-fixation. If these failed then let ventri-fixation be performed. It then became an operation of necessity.

The discussion was then closed by brief replies from the readers of the three opening papers.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting held at Sheffield, March 14th, 1913.

The President, Dr. FOTHERGILL (Manchester) in the Chair.

Present 22 members.

E. S. LEWER, M.D., C.M. (Burley-in-Wharfedale), was elected a member.

Dr. J. B. HELLIER (Leeds) showed :—

TWO CASES OF RUPTURED ECTOPIC GESTATION.

CASE 1. Mrs. E.D., aged 24, married five years, one child five years old, previous good health, ceased to menstruate about Dec. 18, 1912. On Feb. 13, 1913, seized with severe abdominal pain and symptoms of internal hæmorrhage and had slight uterine hæmorrhage. Admitted to Leeds Infirmary. Abdominal section Feb. 14, 12-30 a.m. Much blood found in abdomen.

Gestation sac found in outer half of right oviduct, sac ruptured, blood clot and chorion projecting. Embryo not found, Tube removed, ovary not removed. Patient treated by saline and strychnine. Uncomplicated recovery.

Specimen shows ruptured sac.

Case II. Mrs. H.P., aged 31, ii-para, was admitted into the Leeds Infirmary on Feb. 9, 1913, with ruptured ectopic pregnancy. She had had no child for eight years, health generally good, no serious illness. She had gone eight days beyond the time the last period was due. She was seized with abdominal pain and with faintness at 9-30 a.m. on day of admission and had vaginal hæmorrhage at same time. Admitted 2-10 p.m., almost pulseless, and in very bad condition. Abdominal section 2-30 p.m., about five hours after onset. The abdomen contained much blood. The gestation sac was at the root of the left oviduct and in the uterine wall, blood was escaping from a small laceration and chorionic villi were prejecting. The sac was clamped and excised and the uterine wound stitched over the catgut. Ovaries not removed. Most of blood sponged out of abdomen. Operation completed in usual manner. Was transfused intravenously at operation and had rectal saline after removal to ward, also strychnine. At 6 p.m., pulse 150, could be counted for first time. Recovery uncomplicated.

Specimen shows the sac with projecting chorion, cut in half. It is about one inch long, and is an interesting example of interstitial ectopic gestation.

Pathologist (Dr. M. T. Stewart) reports: Specimen of ruptured tubal pregnancy. Shows typical chorionic villi with many large wandering giant cells. There is also well marked decidual formation. There is much old and recent blood clot.

I find that in the Leeds Infirmary we have had about 90 cases in the last 13 years, which are returned as ruptured ectopic pregnancy, with five deaths. Of these I myself have operated on about 23 with one death. So that we save about 19 out of 20.

I do not suppose that anyone now hesitates for a moment to operate on recent cases. You can have the abdomen open and the tube found and clamped in three or four minutes. It is not well to worry too much about clearing out all the blood clot and the results are excellent.

Dr. J. B. Hellier (Leeds) showed:—

A Specimen from a Case of Septic Miscarriage Infected by B. Aerogenes Capsulatus.

S.A.W., aged 25, was admitted into the Leeds General Infirmary March 1, 1913, at 8 p.m., for sepsis following miscarriage. She was not married. She had a fall down some stone steps on Feb. 25, being five months pregnant, and she miscarried next day. There is no evidence that any other cause produced miscarriage.

Her condition on admission was very critical, pulse 140 and almost imperceptible, breathing rapid and shallow, face pinched, body cold. She complained of pain over the lower ribs on the left side. Over the lowest four ribs distinct emphysematous crepitus could be felt in the subcutaneous tissue but no fracture of ribs could be made out. The abdomen was distended and tympanitic but not very tender. There was hæmaturia. P.V. nothing made out but a bulky uterus corresponding to the recent miscarriage. No marked fœtor in lochia. Passed fæces and flatus, no intestinal obstruction. She died at 11-15 p.m. in a collapsed condition, the emphysema having spread rapidly over the chest and abdominal wall.

She was treated by strychnine, hypodermics of ether, oxygen and saline injections but without success.

The post-mortem was made about eleven hours later. There was a good deal of discolouration of the skin especially about the abdomen and much emphysema in the tissues, the whole body looking much swollen. There was general putrefactive emphysema. In the abdominal wall between the integuments and the deep fascia there were large air spaces, and above and behind the pubes air cavities were obvious. The liver presented a very marked condition of air infiltration, being riddled with small air cavities like fermenting dough, or like gruyère cheese in appearance. Emphysematous spaces were to be seen beneath the mucous membrane of the bladder, where there was cystitis, also in the spleen, kidneys, heart, lungs and elsewhere.

The uterus was large and very soft, not containing any retained secundines. There was some bruising at the right upper angle and when the uterus was distended with water it escaped here through some defect in the wall, but one cannot say that there was clear evidence of local injury other than might have been produced by a blow followed by putrefactive changes like those present in this case. That the uterus was the seat of primary infection is pretty certain, but it cannot be decided that there had been any illicit interference with the pregnancy.

A smear taken from the liver showed a luxuriant growth of B. Aerogenes Capsulatus. The interest in this case lies in the extensive emphysematous changes recognisable before death and marked enough to suggest surgical emphysema from some other cause.

Dr. Arnold Lea (Manchester) said this organism, Bacillus Aerogenes Capsulatus, is always present in human fæces and is probably the organism which was first described by Pasteur as the "Septic vibrio. It is however not normally present in the vulva or in the vagina. It is more often met with clinically, in cases of abortion of the ovum due to bacillus coli or streptococcus. Welch of Baltimore first gave a complete account of the organism and more recently Dr. Herbert Little, now at Montreal, described 12 cases which occurred in the *Johns Hopkins Hospital Bulletin*, Baltimore, in 1905. It has often been found in amniotic infection and unless the uterus is speedily evacuated physometra develops with general septicæmia.

Mr. P. E. Barber (Sheffield) exhibited a specimen of:—

Torsion of the Pedicle of a Subperitoneal Myoma.

This subserous fibroid was attached to the fundus of the uterus by a flattened pedicle about three inches in length, to which was attached a second tumour about the size of a goose's egg. The patient, a nulli-para, aged 40, had only noticed abdominal enlargement for twelve months. Three days previous to examination she had sudden severe abdominal pain, but no vomiting. When seen the pulse was 132, temperature 100·8°, the abdomen was very tense, and tender, but a tumour reaching to the costal margins was felt and diagnosed as ovarian with twisted pedicle. At the operation the uterus and upper part of vagina were found to share in a one and half times twist; the broad ligaments were exceedingly œdematous and the veins enormously dilated. The tumour weighed 15 lbs. on removal. Just as the pedicle, previously clamped, was divided, the electric light went out. The patient made an uneventful recovery.

Dr. Lloyd Roberts (Manchester) asked what was the length of the pedicle?

Dr. Arnold Lea (Manchester) reported a case of :—

Cæsarean Section for Concealed Accidental Hæmorrhage.

A typical instance of the urgent necessity of doing this operation has recently come under my notice.

The patient, aged 29, was admitted into St. Mary's Maternity Hospital on March 3, 1913. She had previously had one miscarriage, and one eight months' child. Labour being natural.

The history obtained on admission was that labour pains commenced during the night of March 2nd. A doctor was called in about 8 a.m. on March 3rd. She apparently looked very ill, and the medical man who saw her immediately decided to send the patient to St. Mary's. She came in a cab a distance of seven miles and was admitted at 1-0 p.m.

I found her remarkably pallid, clearly from loss of blood. The pulse was 96, small and of low tension.

On examination of the abdomen, he found the pregnancy was at full term. The uterine wall was extremely tense and rigid. The head of the child was felt above the brim of the pelvis. No movements were observed in the child, and the heart sound could not be heard, the child was obviously dead. On examination of the cervix, the external os was almost closed, but a little dark blood trickled from it into the vagina.

The condition of "accidental hæmorrhage of the concealed type" was diagnosed.

Arrangements were made for a Cæsarean section to be done as soon as possible. This was commenced at 2-0 p.m.

The uterus was opened—the dead child extracted. The placenta was lying loose in the uterus, at least two-thirds of its maternal surface being completely separated from the uterine wall. The cavity of the uterus was filled with blood clots.

The placenta and clots were rapidly removed, together with the membranes. A gauze pad was introduced into the uterine cavity to control bleeding, and a hypodermic injection of ergotin was given immediately.

The uterine incision was closed in the usual way. The placenta had been situated on the anterior wall.

After closing the abdominal incision I always have the patient placed for a few moments in the lithotomy position, carefully introduce a speculum and wash out the vagina with lysol or biniodide solution ($^1/_{2000}$). The cervix is now held by a volsella, and sterilized gauze swabs soaked in alcohol and acetone, are introduced on sponge-holden, to remove all clots from the uterine cavity. This is supplemented by manual pressure on the fundus from above. A piece of gauze soaked in acetone and alcohol, equal parts, is now passed into the uterine cavity for one or two minutes, and is then withdrawn.

Dr. Lea spoke of the value of this method of removing all clots from the uterus—ensuring free drainage through the cervical canal, and as far as possible sterilising the generative tract.

This should be carried out in all cases, especially those in which doctors have examined outside, or have attempted to deliver by forceps.

This patient has so far as March 14th progressed favourably, and will undoubtedly recover.

The placenta removed from the uterus was shown, which shows very clearly the wide area which was separated, and some of the blood clots which were in the uterine cavity.

In the extremely valuable paper contributed by Dr. Amand Routh, of London, and published in the *Journal of Obstetrics and Gynæcology of the*

British Empire in January and February 1911, which included statistics of 1282 cases of Cæsarean section by Gynæcologists of the United Kingdom, living on June 1, 1910.

On page 41, Dr. Routh states that Cæsarean section for this condition had been done at this time on four occasions by Dr. Bagot, Dr. Briggs, Dr. Savage, and Mr. Targett of Guys.

The cases operated on by Dr. Bagot in 1891, and Mr. Targett recovered.

Two other cases, moribund at the time of operation died, a mortality of 50 per cent.

In conclusion, Dr. Lea stated that there was in his opinion no need to perform hysterectomy in these cases as was done in three out of the four cases referred to above. He believed that this greatly increases the risks of the operation.

Dr. DONALD (Manchester) said he advocated Cæsarean section for Accidental Hæmorrhage years ago but had never met with a case upon which he could perform it. He disagreed with Dr. Lea in leaving the uterus : hysterectomy does not increase the risk of the operation.

Dr. HELLIER (Leeds) said that Dr. Lea was fortunate in having a case where the uterus retracted well after being incised, but the experience of other operators showed that retraction could not be depended on in cases of accidental hæmorrhage and that hysterectomy might be necessary.

Dr. WALLS (Manchester) gave his opinion that generally speaking severe cases of Concealed Accidental Hæmorrhages should be treated by hysterectomy. He pointed out that the case under discussion was of a very unusual type—as the patient was a young woman, 29 years of age, who had been pregnant but thrice, and only once had she gone to full term. He contrasted the conditions pertaining in such a patient, with those encountered in the usual type of severe accidental hæmorrhage, *e.g.*, a woman of 35 or more years of age, who had had eight or nine pregnancies, and whose tissues had so little tone about them as to make hysterectomy preferable to a simple Cæsarean section, inasmuch as the latter form of treatment made no fit provision for the almost inevitable post-partum hæmorrhage, which so commonly carried off the patient. He pointed out that hysterectomy was an extremely simple operation and need take no longer time than the Cæsarean operation.

Mr. MILES PHILLIPS (Sheffield) was surprised that, in a case of concealed accidental hæmorrhage severe enough to require Cæsarean section, the uterus should contract and retract so efficiently. In his own case, reported to the Society last year, the uterus was merely an inert thin-walled bag. The question of conserving it could not be considered. He believed that supravaginal amputation of the uterus, under these circumstances, took very few minutes, if any, longer than careful suture of the uterine incision.

Dr. BARBER (Sheffield) agreed with previous speakers that hysterectomy was a quicker and more reliable method of dealing with cases of concealed accidental hæmorrhage than Cæsarean section—as the danger of post-partum hæmorrhage was obviated. He was interested in Dr. Lea's statement that there was some revealed hæmorrhage, as he had met with a similar case. He thought that this was not sufficiently emphasised in text-books, and that students were apt to think that because there was some revealed there could not be concealed hæmorrhage.

Dr. LEA, in reply, said he still believed that, in this instance at least, as the patient was only 29 years of age, and the uterus was healthy with

good muscular power, any operation such as hysterectomy would have been unfair to the patient and would have rendered the operation more dangerous to life.

Dr. Arnold Lea (Manchester) reported a case of :—

Pan-hysterectomy for Intra-ligamentous Myoma.

A patient, a single woman, aged 40, a weaver, and a "virgo-intacte" was sent to St. Mary's on account of an abdominal tumour which had become very large during the last two years. This was the size of a pregnancy, at eight months, was irregular in shape, and could only be moved slightly. The patient was extremely emaciated. *Recto-abdominal* examination revealed that the tumour was fixed in the pelvis and had invaded both broad ligaments. The cervix uteri was small and quite round as felt through the rectum.

The patient was admitted to St. Mary's Hospital, and the operation of pan-hysterectomy was performed on Monday, Feb. 3rd, of this year. There were many adhesions to the omentum and bowel, and also the vermiform appendix bag stretched over the tumour.

The greater portion of the fibromyoma had invaded the right broad ligament from below. Glistening under the peritoneum covering the uterus and tumour, the right ureter was observed much elongated, and stretched to a narrow band lying on the surface of the tumour.

The peritoneum on the median side of the ureter was divided and the ureter was detached from the tumour without injury. By traction with a screw, and by volsella the tumour was enucleated from the right broad ligament.

The right common iliac artery and veins were exposed to view. The right ureter was replaced in its normal position. Pan-hysterectomy was performed.

The patient though very thin from the growth of the tumour made an uninterrupted recovery and returned three weeks after the operation to her home.

The specimen removed was shown.

Mr. Cuff (Sheffield) reported :—

A Case of Severe Metrorrhagia in a Young Woman.

Dr. Donald (Manchester) said he reported a case twenty years ago where a young girl bled to death : this was before the time of curetting. In his opinion these cases were due to diseased endometrium and not to muscular insufficiency. He had operated upon a girl as young as 13 for this condition. In his experience almost all these cases were cured by curetting.

Dr. Catherine Chisholm (Manchester) said cases of profuse and irregular menstruation are among the most common abnormalities of menstruation in adolescence. As in Dr. Cuff's case these cases often commence menstruation painlessly and later develop pain. The cases most usually met with however do not appear to be adenomatous. They improve with rest at the period time, with general hygienic treatment and without local interference. The percentage of such cases among healthy girls is not large.

Dr. Hellier (Leeds) said that he had recently curetted a young girl who had her first menstrual period which was followed by continuous loss for three months. He obtained a considerable amount of what he took to be adenomatous tissue, but the pathological report by Dr. M. J. Stewart

of the Leeds Infirmary showed that it was tuberculous. It was important to examine such curettings systematically to look for tubercle. In this case no other focus of infection could be made out.

Mr. Miles Phillips (Sheffield) referred to a case of adenoma of the endometrium in a young woman, in which he had considered it necessary to remove the body of the uterus. Curetting on three occasions during two years had been followed by temporary improvement only. The patient became profoundly anæmic and bed-ridden. It was essential that she should earn her own livelihood, as a school teacher. On removal the uterus was found to contain a large number of adenomatous polypi, some of which were over two inches in length. There was no invasion of the muscular wall.

Dr. Arnold Lea (Manchester) said if curetting was done unsuccessfully several times it would often be found that a mucous polypus near the fundus had been overlooked. Before performing hysterectomy in such a case the uterus should be opened and explored.

Dr. Fothergill (Manchester) said several different conditions had been under discussion. This was not a case of menorrhagia of puberty, as this term should be restricted to severe hæmorrhage at the beginning of menstruation, tending to disappear in time. Of course other causes of hæmorrhage might act in later years in patients who had had menorrhagia of puberty. Hypertrophy of the endometrium was a better name than adenoma for overgrowth of the endometrium because adenoma conveyed to the mind the idea of a definite new growth such as a polypus; and also because the word hypertrophy did not commit one to any theory as to the cause of the condition in any particular case.

Mr. Miles Phillips (Sheffield) reported :—

A Case of Ruptured Uterus Treated by Vaginal Hysterectomy.

On June 26, 1912, I was asked to see a patient urgently, under the following circumstances. She was a vii-para, 32 years of age. Four pregnancies, including the last, had ended in miscarriages. Ten days previously she had miscarried, a four months fœtus being expelled. The placenta did not follow, but, as there was no bleeding, the doctor decided to leave it, in the expectation that it would "come away all right" in due course. She was kept in bed for a few days, but as nothing happened—no pain, no loss—she was allowed up, in the hope, I understood, that gravity might help. At the end of a week she had a rise of temperature and persistent headache; this was thought to be due to influenza, as her husband was, at the time, laid up with a severe influenza cold. Finally, on the tenth day, when the temperature had reached 102° F., the doctor thought it wise to remove the placenta, although there was no vaginal discharge and nothing to lead him to think that the retained after-birth was the cause of her fever. She was put under chloroform and the doctor dilated the cervix with his fingers, until he could pass three into the uterine cavity. The placenta was easily peeled off and removed. It was not offensive and there was very little bleeding, but, on withdrawing his fingers it seemed that "they caught on a ridge." He investigated this and came to the conclusion that he must have torn the cervix badly.

I saw her within an hour. She was then just round from the anæsthetic. She was pale but not collapsed, with a pulse rate of 110. She complained of pain just above the pubes. There was a good deal of blood in the bed. With a Sim's speculum in position it was easy to see that the cervix was deeply torn. I packed some sterilised swabs into the vagina and made

arrangements for her to be taken into hospital, a short distance away. It seemed to me that it would be possible to repair the tear. In hospital it was found that her temperature was 104° F., and the pulse rate 120. She was tender above the pubes and had a constant desire to pass water.

On fuller examination under anæsthesia, I found that the tear extended through the anterior fornix into the lower segment of the body of the uterus, and through the peritoneum into the utero-vesical pouch. The base of the right broad ligament appeared to be severed from the uterus. Quite a lot of blood was released from the peritoneal cavity. Apart from an extraordinary friability of the tissues there was no evidence of local sepsis. The uterine cavity contained only a small blood clot. There was no offensive smell. Considering the extensive nature of the laceration and the possibility that the parts were already infected, I decided to remove the uterus by the vaginal route. As the patient was giving the anæsthetist considerable anxiety clamps only were used for controlling the vessels; a firm plug of bismuth gauze was inserted. The appendages were not removed. The operation lasted but a few minutes. An intra-axillary saline infusion, with pituitary extract, was given. The patient soon rallied and within twelve hours the temperature had fallen to normal and there was never any persistent rise afterwards.

On the third day the clamps were removed, and on the fifth day the gauze plug. On the latter night the temperature rose to 100·4° F., but it was down again next day.

There was some sloughing of the vaginal edges but no cellulitis nor peritonitis, and the patient was never ill during her convalescence.

She went home at the end of three weeks, and within a month the vaginal vault was firmly healed.

The chief point of interest in this case lies in the fact that, within twelve hours of removal of the uterus, the temperature fell from 104° F., to normal and remained there, except for one rise of short duration. Though there was no offensive uterine discharge, there was a peculiar flabby and friable condition of the cervix and uterus and of all the structures divided during the operation. Unfortunately no bacteriological tests were made. It seems to me most probable that the fever, which preceded the unfortunate accident and the consequent operation, was due to septic infection of the uterus, and that any conservative line of treatment would have been followed by death of the patient.

Dr. Donald (Manchester) said he once had a case like this and followed out the same procedure. The great value of clamps was the fact that, with them, hysterectomy could be done in a few minutes. In his opinion students were not sufficiently warned of the dangers of dilating a puerperal uterus, the walls ruptured like wet blotting paper.

Dr. Catherine Chisholm (Manchester) read a paper on :—

A Comparison of Menstrual Disturbances in Adolescence and Adult Life.

This paper will appear in the June number of the Journal.

Dr. Chisholm, in reply to a discussion, said it is impossible actually to demonstrate that constipation or passive congestion are the causes of menstrual pain. One can only show that in a certain set of cases constipation is seldom found and that in these cases freedom from menstrual pain is marked, and that where constipation was found, even among the adolescents the percentage of cases of pain was higher than among the other cases. One asks, therefore, are these two phenomena

cause and effect. Further, exercise is stated time after time to relieve menstrual pain and discomfort. That some girls who play hockey suffer badly does not disprove that congestion may be a cause of pain, inasmuch as these girls may be suffering some other abnormality which causes their discomfort. The object of the paper is to point out that menstrual pain is not an inevitable or even a customary accompaniment of menstruation, but that its onset ought to be noticed, its cause sought for, and treated in order that the habit of pain may not be established and the woman's power to work limited.

Dr. Arnold Lea (Manchester) read a paper on :—

Three Cases of Kyphotic Pelvis Treated by Cæsarean Section with Skiagrams of the Three Pelves.

Definition. A kyphotic pelvis may be defined as a form of transversely contracted pelvis. This results from a curvature of the lumbar vertebræ and the sacrum, the curvature being with the concavity forward.

This is usually a result of caries of the lumbar region leading to more or less destruction of the bodies of the vertebræ.

There is often some degree of lordosis in the dorsal vertebræ, which is the result of an attempt at compensation for the alteration in the axis of the lumbar vertebræ.

Another cause of kyphotic pelvis associated with lateral scoliosis is disease of the sacro-iliac joint on one side.

Finally, I have also recently in one case been compelled to do Cæsarean section for a scoliotic oblique pelvis with a contracted outlet, the result of hip disease of one limb.

This makes four cases in which I have performed Cæsarean section on a contracted outlet. The abdomen is usually very pendulous in these cases.

As to the mechanism of labour this cannot be said to exist. Klein's opinion is that in 38 per cent. of cases the occiput is posterior. Malpresentation, brow and face, also transverse, are common. If the head enters the pelvis the obstruction is a narrow outlet. The tuberosities of the ischium are often only $2\frac{1}{2}$—3 inches apart.

Summary of cases of contracted outlet of pelvis. All performed in St. Mary's Hospital:—

(1) Jan. 9, 1908. Aged 27, iii-para. Funnel-shaped pelvis. Transverse diameter at outlet $2\frac{1}{2}$ inches (6·2 c.m.). The patient was not in labour, but at full term. Cæsarean section (no sterilisation) was performed. Mother recovered. Child living.

(2) Feb. 2, 1908. Aged 21, i-para. Kyphotic pelvis. Transverse diameter at outlet. Patient was not in labour, but at full term. Cæsarean section (not sterilised). Mother recovered. Child living. This patient had suffered as a child from caries of the lower lumbar vertebræ.

(3) Feb. 19, 1908. Aged 22, i-para. Kypho-scoliotic pelvis. Not in labour, but at term. Cæsarean section (not sterilised). Recovery of mother. Child living. This patient had suffered from sacro-iliac disease of one side.

(4) Nov. 28, 1911. Aged 24, ii-para. Scoliotic oblique pelvis. Contracted outlet due to old hip disease. $2\frac{1}{4}$ inches (6 c.m.). Cæsarean section at full term (not sterilised). Recovery of mother. Child living.

Diagnosis. This usually presents no difficulty.

(1) The recognition of spinal deformity.

(2) The small transverse outlet of the pelvis, involving both the ischial spines, and the tuberosities.

(3) The diagonal and true conjugate diameter may in cases of pure kyphosis be almost as large, or even larger, than in a normal pelvis, but, if as is not uncommon, scoliosis, or obliquity of the pelvis exists, the conjugate, and the transverse, also the oblique diameters at the brim are much contracted.

Treatment. In most manuals of obstetrics, as for instance in Galabin and Blacker, recently published, 1912, it is stated that " interference is rarely called for " until the child's head has descended into the pelvis.

Another quotation is " If assistance is required forceps is much preferable to version."

" If craniotomy is necessary the cephalotribe should be used."

" Induction of premature labour is also advised."

The practical alternative to all these out of date modes of treatment is, in my opinion, as follows : This is the ordinary classical Cæsarean section. The operation should be performed at full term, preferably before the onset of labour.

MIDLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting held at the Royal Infirmary, Leicester, March 4, 1913.

Dr. MALINS, President, in the Chair.

MYOMA COMPLICATING PREGNANCY.

Mr. J. FURNEAUX JORDAN showed a uterus containing a myoma the seat of necrobiotic degeneration. The tumour had complicated pregnancy and he had performed hysterectomy a few weeks after labour.

The PRESIDENT remarked upon the small size of the uterine body. Apparently involution must have been extremely rapid.

Mr. CHRISTOPHER MARTIN asked for information as to the pathology of red degeneration in fibroids. Personally he had never seen the condition apart from pregnancy. In Mr. Jordan's case, it was remarkable that the tumour had not been the cause of obstructed labour. It showed how easily a large mass will slip up out of the pelvis.

Dr. PURSLOW recalled the similar specimen that he had shown at a previous meeting of the Society, and the discussion that followed upon the pathology of necrobiosis. In his case the neoplasm was cervical in position.

Dr. CLARE asked if pain had been a feature of Mr. Jordan's case. He believed that Mr. Bland Sutton was accustomed to diagnose this type of degeneration upon the occurrence of pain only.

Mr. MARRIOTT agreed that red degeneration is usually associated with pregnancy but he had removed a uterus with a very degenerated fibroid of this nature in which no pregnancy had occurred.

Mr. WHITEHOUSE thought that if all cases of red degeneration were collected, quite a large number would be found to have no relation at all to pregnancy. Certainly the last few cases that had come under his notice were not associated with this condition.

Mr. FURNEAUX JORDAN, in his reply, stated that pain was certainly a feature of his case. In fact, a few weeks before term, discomfort was so marked that the patient thought that labour had commenced. The apparent extreme involution of the uterus was an artefact and really due to the preservatives employed.

Ligaturing Forceps for Pelvic Surgery.

Dr. N. J. Spriggs showed a new ligaturing forceps that he had designed for the easy and quick application of ligatures in inaccessible situations, particularly in pelvic surgery. The instrument is a combination of a haemostatic forceps, designed to carry a ligature loosely knotted, with a sliding arrangement for pushing off and tightening the knot. It is rather complicated but not more so than a tonsil guillotine and it readily takes to pieces for cleansing purposes. It has not yet been manufactured in quantity, but enquiries should be addressed to Messrs. Weiss and Son, Oxford Street, London, W.

The President remarked upon the ingenuity of the instrument and thought that it might certainly be useful in applying ligatures in some difficult situations.

Mr. Bond said that he always had some little diffidence in employing very complicated instruments. For ligaturing superficial vessels, it would be easier to use the ordinary method, but as regards deep vessels Dr. Spriggs' instrument might be of value.

Localising Peritonitis of Puerperal Origin.

Dr. H. J. Hicks read a short communication upon localised septic peritonitis of puerperal origin which appears on p. 300 of the present number of the Journal.

The President expressed his surprise at one remark in Dr. Hicks's paper, viz. :—that the "Streptococcus does not cause as much permanent damage to structures as does the gonococcus." He was of the opinion that gonococcal infections as a rule produced a less severe degree of inflammation than did the streptococcus.

Mr. Beckwith Whitehouse thought that Dr. Hicks had brought forward a most interesting and very important paper. It certainly raised many debatable points, but for his part he was in entire agreement with the conclusions enunciated by the author. The points that he would particularly like to refer to were the importance of simple drainage from below, and the value of waiting until the acute symptoms had subsided. The observance of these two facts undoubtedly saves the lives of several patients who would be lost if more radical measures were employed. With regard to the virulence of the infection, the type of streptococcus probably had some influence in this direction. Mr. Furneaux Jordan had recently shown that the streptococcus which occurs in puerperal infections was frequently of a specific type and he had named it the "Streptococcus Puerperalis."

Mr. Furneaux Jordan said that none of the cases brought forward by Dr. Hicks could conveniently be drained by the abdomen. Localised septic peritonitis might certainly be dealt with by the vaginal route, but if septic tubes and ovaries were to be treated, then he thought that an abdominal incision was preferable. As a rule a definite organism was present in these cases, and if possible an autogenous vaccine should be administered. Each case must be judged on its merits and the progress of the symptoms was the index for treatment. No rule could be laid down, and in the majority of cases he thought that the more radical the operation, the better the result.

Mr. Cecil Marriott gave details of a case of pyosalpinx and abscess of the broad ligament occurring 21 days after labour. He had attempted to reach the same extraperitoneally, but had found it necessary to perform laparotomy and drain through the abdomen. The patient recovered.

Dr. PURSLOW asked what material Dr. Hicks used for ligatures and sutures in this type of case.

Dr. HICKS, in reply, said that he always employed catgut sutures where the suspicion of sepsis was present. In spite of Mr. Furneaux Jordan's friendly criticism he was still firmly convinced that the best method of treating a puerperal pyosalpinx was that of simple drainage. The infected tube frequently was high up but nevertheless the pus could be reached by this route, and was a far safer procedure than that of laparotomy and removal of the diseased appendage, at any rate during the acute stage.

NOTES ON CASES OF HYSTEROPEXY.

Mr. CECIL MARRIOTT read a short communication upon cases of hysteropexy. He referred to the pathology of uterine displacements and briefly passed in review the various operative measures that have been adopted within recent years to remedy the defect. The operation that he preferred was a modified vaginal fixation and this he had successfully employed for several years.

Mr. CHRISTOPHER MARTIN had tried most of the various "new" operations that had been devised for the cure of retro-displacements of the uterus, but had come to the conclusion that none were so efficient as the old "ventral fixation." If the sutures are placed below the level of insertion of the round ligament, then no fear need be entertained if pregnancy should occur. Abortion under these circumstances does not take place.

In the case of complete uterine prolapse, he thought that there was no better treatment than by Simpson's "Shelf Pessary."

Mr. BECKWITH WHITEHOUSE said that during the last two years the method of fixation that he had adopted had been the "sling" operation of Clarence Webster. In performing this operation it was necessary to use silk sutures and also always to suture each round ligament to the uterine wall. Otherwise intestinal obstruction might occur from the passage of a coil of small intestine between the uterus and the loop formed by the round ligaments. Out of the last 30 cases treated by this operation, there had been one recurrence. One patient was now three months pregnant and the pregnancy was pursuing a normal course.

Dr. PURSLOW remarked with regard to the "Shelf" pessary advocated by Mr. Martin that upon one occasion he had had great difficulty in removing one of these instruments from the vagina. It had in fact ulcerated completely through the vaginal wall and part was lying in the bladder.

The PRESIDENT observed that the proper *use* and the *disuse* of a pessary were quite different things. Dr. Purslow's case was an example of gross disuse of a pessary on the part of a patient and could not be used as an argument against the proper value of the instrument.

CONGENITAL INTESTINAL OCCLUSION.

Dr. N. J. SPRIGGS read a paper upon congenital intestinal occlusion, being an account of twenty-four unpublished cases, with remarks based thereupon and upon the literature of the subject. This paper will appear elsewhere.

The PRESIDENT congratulated the Society upon having such a valuable communication made before it. The amount of work entailed in Dr.

Spriggs' investigation into this little known subject must have been immense, and he heartily thanked the author for bringing it forward.

Mr. BOND referred to a patient that had come under his observation upon whom a colotomy had been performed thirty years previously for occlusion of the large bowel. The lumen of the gut below the colotomy was then no more than the size of a lead pencil.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

President—A. J. HORNE, F.R.C.P.I.

Sectional Secretary—G. FITZGIBBON, M.D., F.R.C.P.I.

Friday, February 7, 1913.

The PRESIDENT in the Chair.

Dr. MADILL related

Two Cases of Rupture of the Uterus.

In the first, on opening the abdomen the fœtus, all except the head, was found to have left the uterus through a large rent. The placenta was loose in the uterus and there was much intra-peritoneal hæmorrhage. Supra-vaginal hysterectomy was done and the patient recovered.

In the second, when the abdomen was opened, both the fœtus and placenta were found to have left the uterus through an enormous rent. There was much intra-peritoneal hæmorrhage. The bladder was badly torn. Hysterectomy was immediately performed, but the patient died at the termination of the operation.

The cases were discussed by the PRESIDENT, Dr. JELLETT, Dr. SHIELL, Dr. SOLOMONS, and Dr. PUREFOY.

Dr. HASTINGS TWEEDY exhibited a specimen of

Cancer of the Uterus removed by Wertheim's Hysterectomy.

The patient had consulted him on account of severe hæmorrhage, which, after the uterus had been removed, was seen to have been caused by a small sub-mucous fibromyoma.

The case was discussed by Dr. PUREFOY.

Dr. JELLETT read a paper on

The Surgical Treatment of Pelvic Thrombosis of Pelvic Origin.

It dealt first with essential differences between acute and chronic pyæmia. Dr. Jellett referred to a case that had died last year in the Rotunda Hospital of pyæmia with thrombosis of the ovarian vein, as shown at the post mortem examination. He consequently decided to operate on future cases of a similar kind. He then recorded three such cases, in all of which the initial history was characterised by recurrent rigors, high temperature, and rapid

pulse. In the first case, on the fifteenth day, a swelling was found in the right broad ligament. He opened the abdomen and removed a large thrombosed and suppurating ovarian vein, round which was a considerable amount of cellulitis. The patient rapidly got well. In the second case he did not operate until the thirty-ninth day, as, owing to absence from the hospital, he had not seen the patient before. In this case he removed a tense, cord-like structure which turned out to be a thrombosed ovarian artery, and also removed the ovarian vein, which contained a small thrombus in its lower part. In this case the patient had a few rigors after the operation, but then they disappeared, and her temperature fell to normal and remained so. In the third case a very similar condition to that met with in the first was found at operation, except that it had gone much further. Septic peritonitis was on the point of starting, the whole length of the ovarian vein contained pus, and there were two abscesses beside the vein. The patient improved for a few days after the operation, then gradually lapsed, until on the thirtieth day after confinement she was as bad as before the operation. From her symptoms at that time she was believed to have thrombosis in the internal iliac vein, and the abdomen was opened with the object of tying it. Thrombosis, however, was not found in this vein, but there was apparently thrombosis and suppuration in the uterine vessels on the right side, and so a hysterectomy was done. The patient improved temporarily, but rapidly became again seriously ill, and died on the thirty-fifth day with symptoms of septic involvement of the lungs. In conclusion Dr. Jellett referred to the interesting fact that in all his cases the thrombosis was on the right side, and primarily in the ovarian vein alone. Consequently, they were favourable cases for operation. He considered that such cases called for operation always, and that it should be as early as possible to anticipate conditions such as were found in the third case. He considered the diagnosis was the important point, and that, as a rule, one could make it from the symptoms of the patient, taken in connection with thickening or swelling in the broad ligaments, and associated with the comparatively little pain or tenderness.

The paper was discussed by Professor Smith, Dr. Shiell, Mr. Pearson, and Drs. Rowlette, Purefoy, and Jellett.

GLASGOW OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Fifth Meeting.

A meeting of the Society was held in the Pathological Institute of the Glasgow Royal Infirmary on February 26, the President, Dr. Lindsay, in the Chair.

Professor Teacher gave a demonstration of gynæcological specimens illustrating various conditions; the most noteworthy being, Sections of the Genital Gland of a Case of Hermaphroditism showing both Ovarian and Testicular Tissue Elements; Specimens of Ovarian Pregnancy; and a Specimen of a Uterus showing Ectopic Pregnancy in a Rudimentary Fallopian Tube.

A lantern demonstration was also given on the Embedding and Development of the Early Human Ovum. The Professor reviewed the present state of our knowledge of the subject, more particularly in relation to the work

of Professor Bryce and himself. The lecture was illustrated by numerous lantern slides and by micro-projection of sections of the Teacher-Bryce ovum. Dr. Teacher stated that this preparation still represented the earliest known stage of the human ovum, the only more recent specimen at all comparable in age being that of Young of Edinburgh, which is apparently intermediate in development between it and the ovum of Peters, but probably abnormal. Several very valuable ova of about the age of Peters' have been found within the last five years, and the examination of these has confirmed and extended the discoveries due to that famous preparation.

Dr. Teacher also reviewed the position of the theories of the nature of menstruation and its relation to ovulation and fertilization.

The discussion which followed was taken part in by Dr. SLOAN, Dr. OLIPHANT, Dr. MUNRO KERR, Dr. MARSHALL, and the PRESIDENT.

REVIEWS OF RECENT BOOKS.

"Die Behandlung der Frauenkrankheiten" (The treatment of women's diseases). By Professor J. VEIT, Director of the University Frauenklinik in Halle. Berlin: S. Karger. Pp. 244, with 39 illustrations, some partially coloured. Price, Marks 8.20.

THIS is a book whose modest size and appearance do not betray the wealth of mature advice and useful information contained within its pages. It is a book of a type we do not often see; and this is a pity, for it is a type which is more useful, at all events to the practising gynæcologist, than the most elaborate text-book or complete system. It represents the opinions of a renowned gynæcologist who, in the course of long experience, has continually balanced methods, sifted results and re-arranged his procedure before settling down to his present practice.

As Professor Veit points out in his preface, his intention in writing this book is to present to us "the fixation of his present-day standpoint" in regard to the treatment of the diseases of women. He describes, therefore, only those methods which he himself has tried and proved in his practice, and has not troubled to discuss the views of those from whom he differs.

The book opens with an introduction in which the present-day gynæcologist is dissected with a deftness only possible to one who himself has passed through the ups and downs of this branch of practice and has helped to raise it to the great position which, as a special branch of medicine and surgery, it now holds. Here, too, will be found sound arguments why gynæcology should remain a limited branch of practice, instead of being delegated to surgeons with a special interest in the female pelvis; also, why gynæcology and obstetrics should always be practised together. The younger gynæcologist will find much sound advice, quite apart from the treatment of specific disease; though he must always endeavour to find out what is *objectively* diseased, and only to treat, when possible, what is *objectively* diseased. Professor Veit well describes the difficulties presented by the class of patient whose sufferings are genuine, and yet in whom objective signs of disease are absent, who require general rather than local treatment, and to whom the "pious lie of suggestion" is often justifiable. The gynæcologist must have an equal mastery both of conservative and operative methods of treatment and must have a nice discrimination of when to employ either.

The book is divided into two parts, general and special. The general part occupies about fifty pages, and deals with such points as arrangement of the consulting and examining room, methods of examination, methods of local and general treatment, *x*-rays, the technique of laparotomy, drainage, after treatment of abdominal operations, the technique of vaginal operations, methods of anæsthesia. The special part occupies the rest of the book. It is difficult to choose sections for individual notice: the section on Sexual Neurasthenia is remarkable for its keen insight and sound discrimination between cause and effect: other sections which particularly appealed to us were those on Uterine Hæmorrhage, Retroflexion and Prolapse of the Uterus, and Parametritis.

Even if it were not impertinent, it would nevertheless be out of place, to attempt criticism of this little masterpiece of gynæcological literature. We wish merely to indicate to prospective readers its scope, its unusual type, and its brilliant contents, and to assure them that they will find it not only one of the most useful but also one of the most charming books that has appeared in recent years. E.H.

"A Cyclopædia of American Medical Biography." Comprising the lives of Eminent Deceased Physicians and Surgeons from 1610 to 1910. By HOWARD A. KELLY, M.D. Illustrated with portraits. In two volumes. Philadelphia and London : W. B. Saunders Company. 1912.

OUR readers all know Professor Howard Kelly as a leading authority in gynæcology, and not only those who labour in other departments of the medical profession, but the literary world as well recognize him as the author of essays of high value on archaic medicine and the biography of deceased doctors, essays scattered amidst the numbers of the *Bulletin of the Johns Hopkins Hospital* and elsewhere. His example has stimulated younger members of our profession in the United States, and the pages of our able contemporary the *American Journal of Obstetrics* include numerous records of the past. The JOURNAL itself, thanks to our contributors, has displayed more than passive sympathy with medical history.

Such work however must be lost or wasted save to those living in the neighbourhood of big libraries where serials are bound and preserved for reference, unless their essence be concentrated in special monographs or dictionaries. It is with the latter class of publication that we are here concerned. A dictionary of American medical men supplies a want, nobody could be fitter to supply it than Dr. Kelly, and our readers must sympathize with his efforts since, as we understand, they show interest in the historical work to which we have alluded. Better still, they will not be disappointed. The lives of great general physicians and surgeons, Austin Flint, Valentine Mott, Lewis Sayre and others are ably epitomized. We should have desired a little fuller information about Horace Wells and William T. G. Morton, but the compiler begins his article on the former by plainly stating that "the credit of first using inhalation of an effective anæsthetic for surgical purposes is generally assigned to Horace Wells, a dentist of Hartford, Connecticut," and his note on the latter commences with the statement that the "credit of demonstrating the practicability of ether anæsthetization must be ascribed to William Thomas Green Morton, son of a store-keeper farmer in Charlton, Massachusetts." Plain statements are satisfying to the student of medical literature especially when, as in this case, they proceed from the pen of an authority, and, as in the case of most of the articles in this *Cyclopædia*, original writings on the high deeds of Wells and Morton, and their claims, are named in reference at the end of each of these biographies. The value of such references is specially manifest when they direct us to so deep a subject as the history of anæsthesia. Those who consult the Dictionary will find equally important references attached to the biographies of McDowell, of John Light Atlee and Washington Atlee, two American authorities sometimes confounded with each other on this side of the Atlantic, and of numerous other gynæcologists and obstetricians. For our speciality is fully represented in the States and is well treated in the *Cyclopædia*. This statement turns our attention to its introductory pages where we find a list of the authors who have prepared the biographies under its able superintendent and his collaborators, and summaries of the share played by Americans in the advance of the different

departments of medical science and art. Professor Howard Kelly has himself undertaken the synopsis of the history of Gynæcology and Obstetrics in America, and the *Cyclopædia* is almost worth procuring for that interesting summary alone. Our readers will find most instructive biographies of McDowell, Marion Sims, Fordyce Barker, Bozeman, Galliard Thomas, Paul Mundé and other names growing distant, but not likely to be forgotten, names of men whom the *Cyclopædia* will save, not only from oblivion, but also from the perhaps worse fate of misrepresentation by confusion of their labours and their priority as pioneers of ovarian and uterine surgery.

A.D.

"Der Infantilismus, die Asthenie und deren Beziehungen zum Nervensystem." Von Dr. PAUL MATHES, Privatdozenten für Geburtshülfe und Gynäkologie an der Universität in Graz. Mit 8 Abbildungen im Text. Berlin, 1912: S. Karger. ["Infantilism and Asthenia and their Relations with the Nervous System. By Professor PAUL MATHES, Privatdocent in Obstetrics and Gynæcology in the University of Graz. With 8 illustrations in the text. Pp. 188.]

THIS is an interesting, almost an entertaining book. The words infantilism and asthenia do not in the least degree indicate what is found inside its boards. The author begins, it is true, with infantilism, that curious congenital asthenia which seems to hold back the development of the individual and prevent him passing with the passing years into the physiological and psychical experiences and capabilities of these years. Nay more, he is not simply infant, he is sometimes better described as fœtus—not infantilism but fœtalism is his malady. The anatomy of infantilism is then described fully and clearly; the skeletal changes, with the curious association of thoracic peculiarities and the tendency to phthisis, the genital changes, those in the blood vessels, and the status thymico-lymphaticus are all detailed, along with certain less known local signs of infantilism, such as the child-like character of the upper lip. Then, after stating his opinion that this morbid state is not so much the result of defect in any of the organs with an internal secretion but is rather a developmental arrest determined in the germinal stage of life, the author passes on to a full inquiry into the subject of the anatomy of asthenic enteroptosis, intra-abdominal pressure, intra-pelvic pressure, and prolapsus uteri. Then he passes to the clinical side of the matter, nervous phenomena of the menarché and the menopause, with passing flashes of light on the Women's Rights Agitation, Feminism, and the education of the modern girl, to an appeal for psychical treatment in such cases and especially for psycho-analysis and similar methods, and to several other matters which are at present exciting controversy. We may not agree with the conclusions reached in this work, but we cannot afford to leave the book unread if we wish to keep in touch with the medical aspects of some disturbing problems of to-day.

J.W.B.